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Industrial FINISHING

Published Monthly in the Interest of Modern Protective Finishing

Are You . .

"going around Robin Hood's barn" in an effort to get the **right** finish on your product?

LILLY'S SPECIFICALLY Formulated Finishes

provide a direct way to the **right** finish, for ever since we adopted the slogan "With the right finish, you'll finish right" more than ten years ago, our efforts have been concentrated, our staff enlarged, our laboratories and plants expanded—always with one predominant thought—that of producing **specific** finishes for **specific** products and purposes.

LILLY VARNISH COMPANY
Indianapolis, Indiana
Branches : Chicago, Ill.; Grand Rapids, Mich.; Gardner, Mass.
THE LILLY COMPANY, High Point, North Carolina

Beauty Takes a Beating!

Yes, it's possible for a finish to withstand a tough beating and still retain original eye-appeal for years. That's why hot water heaters are finished with Roxyn 11C, which meets the conditions of any type installation.

Roxyn 11C is equally good in the basement where positive protection against moisture and dirt is required or in the kitchen where the finish must match perfectly with ranges and refrigerators and be completely unaffected by grease and repeated washing. At the same time Roxyn 11C will not turn yellow when exposed to elevated temperatures in service and is so mar-resistant that accidental abuse will not detract from its good appearance.

ROXALIN FLEXIBLE LACQUER CO., INC.
Box 119 • Elizabeth, New Jersey

ROXALIN *Flexible* FINISHES

SKILSAW DISC SANDERS

ARE WAY AHEAD AT THE FINISH!

SKILSAW DISC SANDERS do all finishing jobs faster, better *and at lower costs* . . . because they are more powerful, more rugged, more dependable. In every industry they are preferred for surfacing work in production, repairs and general maintenance. They file, grind, buff, sand and polish on flat or curved surfaces of wood, metal, stone, tile and compositions . . . with grinding wheels, wire brushes, polishing bonnets, rubbing pads and sanding discs. Everywhere . . . in every way . . . SKILSAW DISC SANDERS ARE way ahead on every finishing job. Ask your distributor to demonstrate them for you. 5 powerful models to choose from.

SKILSAW, INC., 4745 Winnemac Avenue, Chicago, Ill.

New York • Boston • Buffalo • Philadelphia • Cleveland • Kansas City • Atlanta
New Orleans • Dallas • Los Angeles • Oakland • Seattle • Toronto, Canada

ZAPON—IN STEP WITH CHANGING NEEDS

In their 115 years of making fine furniture, the Heywood Wakefield Company has seen drastic change in styles, revolutionary improvement in finishes and their application. Many years ago we started supplying their lacquer and sealer, when their schedule employed an air dry system. More recently, when Heywood Wakefield introduced a conveyor system with force-dry ovens, Zapon developed a special lacquer and a sealer, adaptable to the new schedule. And, equally as important, these new finishes were better and less expensive.

Zapon finish service not only starts right, but it marches along with our customers, meeting and anticipating their needs.

Photo, courtesy Heywood Wakefield Co.

ZAPON

ZAPON DIVISION · ATLAS POWDER COMPANY

Eastern Sales: Stamford, Conn. *Western Sales:* North Chicago, Ill.

INDUSTRIAL FINISHES

Seventeenth Year of Publication

Industrial FINISHING

Reg. U. S. Pat. Office

Published Monthly in the Interest of Modern Production Finishing

Vol. XVII, No. 11 SEPTEMBER, 1941 $2.00 a Year

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Letters from Readers...

OF INDUSTRIAL FINISHING

These letters (and many others) were answered recently by the editorial department, but are published here to reveal certain interesting trends of desire and activity in the industry, and to encourage additional inquiries, comments and suggestions. Further information about any of them can be obtained by writing this office.—Editor.

Rust-Proof Coatings

We are interested in obtaining the names and addresses of the companies that manufacture and sell rust-proof coatings, as discussed in the second letter shown on page 4, of June issue of INDUSTRIAL FINISHING.—E. S. Co. (Engineering & Drafting Specialties).

Information supplied.—ED.

Infra-Red Lamp Article

Our attention has been called to the article in your current issue of INDUSTRIAL FINISHING. on the infra-red lamp installation at the J. C. Virden Co. in Cleveland, Ohio. We are interested in obtaining two copies of the magazine. Would you be so kind as to refer this request to the proper person in your organization and send the two copies to us?—E. Production Magazine.

Copies sent promptly.—ED.

Graining Rollers

I have been reading, in your June and July issues, articles regarding the graining process . . . . overcoming the weather conditions on the gelatin roll by the use of a roller made of synthetic rubber.

Due to the contemplated shortage of mahogany and other foreign woods, I believe there is going to be quite a demand for the imitation of these woods. I am interested in obtaining all of the information along these lines that is possible to secure.

I would appreciate your sending me the name of the manufacturer of synthetic rubber rollers.—A. D. (Industrial Sales Manager).

Wood Patching Putty

We have a copy of February 1941 issue of INDUSTRIAL FINISHING and note an article on "Wood Patching", on page 101. We are interested in knowing what kind of putty is used, as explained in this article.—K. Mfg. Co. (Upholstered Furniture).

It is "Sani-tal-ric Crack and Crevice Filler", sold by G. J. Liebich Co., 931 Ogden Ave., Chicago, Ill.—ED.

Rubbing Machines

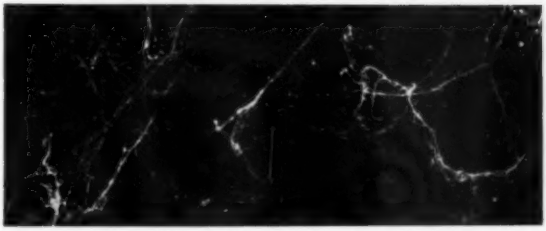
I would like some information on oil-rubbing machines which were advertised in your February INDUSTRIAL FINISHING. I have mislaid the book. Would like to have a catalogue showing the sizes and prices on the rubbing machines.—J. J.

Magic Tack Rags

We are in the market for Magic Tack Rags, and would like to know if you can refer us to some company who would be able to sell to us wholesale.

WEBBING LACQUER

something new and different!



For use on wood, metal, paper, composition board or glass. Unlimited range of color combinations and effects. Write for complete information.

V. J. DOLAN & COMPANY, INC.

Mnfrs. of "Unquestionable Quality" Industrial Finishes

1830 N. LARAMIE AVE. CHICAGO, ILLINOIS

Do You

Air Dry or Force Dry?

Perfection Synthetic Flat Finishes will do both. Air dry overnight or force dry in 1½ hours at 140°.

Panels coated with Perfection Flat Varnish can be immersed in water for 30 days without turning white or showing any other ill effects. Write us and we'll send panels and samples — and also a panel in water for 30-day immersion test.

PERFECTION FLAT FINISHES contain no stearates or other flattening agents. They are made 100% from gum, hence are as clear as gloss varnish — entirely free from milky appearance of conventional flat varnish.

Also, PERFECTION SEALER VARNISH covers 65% more surface than lacquer sealers — try them today.

PERFECTION PAINT & COLOR CO.

Indianapolis, Indiana

Priority Orders . . .

UNITED'S DEFENDER LINE

production finishes have been developed by its chemists to meet the specifications and requirements of manufacturers of products for defense. If you have a production finishing problem on defense products with priority ratings you will find a quick solution among the DEFENDER LINE production finishes.

Your request for working samples and complete information will receive prompt attention.

LACQUERS
THINNERS
ENAMELS
METALIZED FINISHES
SYNTHETICS

UNITED LACQUER MFG. CORP.
General Offices and Factory: Linden, New Jersey
New England Mfg. Division: Boston, Mass.

Speed . . .

your wood finishing with *tough, fast-working* Mar Proof Lacquer!

Better, smoother wood finishing — with savings of precious hours from your finishing schedules — awaits your test of modern Mar Proof Lacquer. It dries quickly to a beautifully clear, "hard as nails" finish on maple, gum, mahogany and other cabinet woods. Made in Clear Gloss Rubbing and Satin Finish. We recommend Mar Proof Lacquer Sealer for first coat . . May we send you working samples?

Write for FREE Working Samples

THE SCHAEFER VARNISH CO., Inc.
Louisville, Ky.

Schaefer's MAR PROOF LACQUER

We noticed in I.F. that there was a company that did manufacture magic tack rags, but we did not take note of this company's name. Now that we are in the market for these tack rags we hope you will be able to refer us to someone.—F. Cabinet Co. (Fine Store Fixtures).

Write to Wm. Juergens Co., 4036 La-Grange St., Toledo, Ohio.—ED.

Heat Resisting Paints

We understand from the National Research Bureau that an article entitled, "Heat Resisting Paints" appeared in the April 1941 edition of your magazine. We are quite interested in this subject and would appreciate it if you could send us a copy of this article.—F. B. Co.

Copy of magazine sent.—ED.

Air-dry Wrinkle

Several months ago we saw in INDUSTRIAL FINISHING, either an ad or an editorial note about black wrinkle finish, black crackle finish or black crystallizing lacquer which does not require baking. We wonder if you would help us locate the manufacturer of this product?—C. Instrument Co.

We have been trying to secure a small quantity of wrinkle finish lacquer or enamel from some of the people who advertise in your magazine. So far, we have not been able to find a manufacturer of an air-drying wrinkle finish. We would appreciate any contact that we may be able to make through your service.—Hershey Vocational School. (Defense Education). H. V. S. Derry Township School Dist., Hershey, Penn. (Robert T. Stoner, Dir. Voc. Edu.).

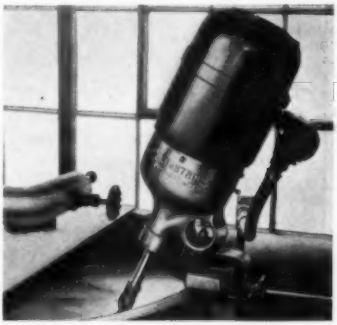
Information given—ED.

Wanted, Metal Filler

In the April 1941 issue of INDUSTRIAL FINISHING, on page 7, we note the following paragraphs under the above title:

"We have a problem which has caused us some difficulty and we have been unable to locate a suitable material to correct the trouble. Perhaps you know of some manufacturer who can supply an item to help us.

"We require some sort of a filler that can be used on sheet metal to fill irregularities in the metal surfaces, such as spot-weld marks and cracks or seams where the metal is joined to-



Direct Drive "LIGHTNIN" Portable Mixer used for maintaining proper consistency and suspension of pigment in a special enamel. Where colors vary frequently and quantities are not too large, this type of agitator can be conveniently changed from one tank to another.

KEEP PIGMENTS IN UNIFORM SUSPENSION AND REPLACE EVAPORATION LOSSES WITH A "LIGHTNIN" MIXER

With primer dipping tanks operating 24 hours a day, consistency must be constantly maintained in the quickest, most dependable manner . . the reason more "LIGHTNIN" Mixers are being specified than ever before.

The powerful "LIGHTNIN" Double Mixing Action drives pigments up off of tank floor and keeps suspension uniform. The complete bottom-to-top turnover plus a slow rotating which completely eliminates dead spots thoroughly mixes in thinner to make up for evaporation losses.

If you have a problem keeping pigments in suspension or keeping consistency uniform, consult us. Our specialized mixing experience is yours for the asking.

MIXING EQUIPMENT COMPANY, INC.

1027 GARSON AVE. ROCHESTER, N. Y.

FORM - A - ROC

We offer to all industries equipped for baking finishes this highly perfected, heat-converting, synthetic enamel.

FORM - A - ROC

We have combined to an optimum degree the necessary qualities of tremendous hardness, great adhesion, smooth lustrous gloss, and freedom from haze, discoloration and wrinkling.

FORM - A - ROC

Baking schedule is of great flexibility, permitting from 5 - 50 minutes at 250 - 375° F.

FORM - A - ROC

No matter which of the present worthy finishes of this type you may be using or planning to use we sincerely recommend that you investigate

FORM - A - ROC

MADE BY

THE VARNISH PRODUCTS CO.

5288 Harvard Avenue

CLEVELAND, O.

gether which, after drying, can be sanded down to a feather edge by using a sanding disc or drum. This material would be used underneath baked finishes.

"If you know of any such item we would greatly appreciate your advising us as to where it can be procured. —A. D. Co. (Designers & Manufacturers)."

We note also that information has been supplied concerning this inquiry and since we have ourselves been endeavoring to find an answer to this problem for some considerable time, we shall be greatly obliged if you would advise us of the solution.

In our case the material is for use underneath an automobile body finish comprising primer baked at 250° F., surfacer baked at similar temperature, and finishing coats of cellulose lacquer. We have, so far, been unable to find any filler other than solder which will resist penetration by lacquer solvents.

The result of this penetration is, of course swelling, and after the surface has been flattened and polished, gradual shrinkage occurs which, under a glossy finish, reveals the presence of the filled irregularity. We believe that many firms in the automobile body industry would be interested to find a non-metallic material which could be used as a filling material in cases where solder must now be used.—Pressed Steel Co., Ltd., ENGLAND.

Information supplied.—ED.

Gilding Tool

We are interested in securing the name of a manufacturer who produces a tool to apply gilted floral bands on leather tops for occasional pieces. I would appreciate hearing from you by return mail.—P. F. Co. (Bedroom and Dining Room Furniture).

Try W. H. Coe Mfg. Co., 89 Ship St., Providence, R. I.—ED.

Miskella Defends His Article

Referring to Mr. Chas. S. Pearce's comment (Aug. issue pages 4,7) on statements made in my article about, "Infra-red Baking of Flourescent Reflectors", as published in July issue, I still maintain that what was presented in my article is correct . . .

1) There are no electric lighting fixtures coated with paint. On the other hand, there are thousands of them coated with a baked, synthetic white enamel. This is in competition with the fired porcelain glass enamel.

2) Mr. Pearce may know his porcelain enamels, but he is sadly misin-

(Continued on page 79)

Priorities Will Affect You

Where you stand as to the classification of your industry. What chances you have of getting needed materials—regardless of promises. How you can make what materials you get go farther. What you may have to turn to in the way of substitutions.

BY HARRY DANIELS

THE GREAT demands made upon the productive facilities of the country by the defense program has brought about a shortage of many raw materials used in the protective coatings field. Some of the most important of these are now under industry-wide control (such as zinc, aluminum, iron and steel, vinyl chloride). These are obtainable only through release by the O.P.M. The output of many other materials is being almost completely consumed in producing finishes for direct defense industries. The O.P.M. has set up the priorities system so that these industries will get the raw materials and finished products they need. Civilian industry will get what's left, if anything.

We will assume that those who are working on defense contracts are well acquainted with the priorities system and that they know how to get about getting the materials they need. In this article I will point out some of the steps taken by the Office of Production Management and the Office of Price Administration and Civilian Supply to avoid dislocation of "non-defense industry." I will also show some steps that the individual manufacturer can take to cooperate with the defense effort and at the same time improve his own position.

The first civilian allocation program affecting the paint industry is an order issued in July by the Office of Price Administration and Price Control. It sets up three classifications of non-defense users of formaldehyde, hexamethylene tetramine and synthetic resins produced therefrom. These classes are listed in the accompanying table.

Of available supplies of resins, users under Class A shall be given Primary preference; users under Class B, secondary preference; and users under Class C no preference at all. The order does not give preference if substitutes can be used. If insufficient resin is available for Classes A and B, rationing is to be resorted to, and none furnished under Class C. Provision is made for exceptions in order that more severe dislocations are not brought about than those being forestalled.

The classifications are effective as of August 23, 1941, and are set up as follows: *(See page 12)*

One Man You Can
PITTSBURGH STANDS FOR QUALITY
PITTSBURGH

Always Count On!

IF *you* have a tough finishing problem . . . a problem in reducing rejects, cutting drying time, speeding up production . . . then there is one man you can always count on to help with its solution—the representative of Pittsburgh Industrial Finishes Division.

For the Pittsburgh man who calls on you (or wants to) is backed by an able organization of Technical men, that has solved the highly specialized finishing problems of manufacturers all over the country. These men are ready to work with your own department . . . right in your own plant. They will apply practical experience gained by Pittsburgh during eighty-five years of service to American industry. And when they recommend a finish, you will *know* that it is the proper finish . . . custom-made to fit your most exacting, special requirements.

Make This 5-Day Test

Why not give these Pittsburgh Technical men the chance to help you. Consult with them. Then arrange a 5-Day Test run of Pittsburgh Industrial Finishes in your own plant. If your experience is like that of most manufacturers, you will find that production costs are cut, finishing problems eliminated!

The attached postcard will bring a Pittsburgh representative at your convenience. He will consult with your men and advise the proper solution to your knotty finishing problems. Why not mail it in now?

• • •

PITTSBURGH PLATE GLASS COMPANY
Industrial Paint Division, Pittsburgh, Pa.
Thresher Varnish Company Division,
Dayton, Ohio

PAINT AND GLASS

Industrial FINISHES

Get Valuable Free Book On Industrial Color-Styling

● Please fill out the attached postcard for your copy of Pittsburgh's valuable new free book, "Industrial Styling With Color," describing Pittsburgh's industrial finishing services. No obligation!

(Civilian allocation program for formaldehyde, hexamethylene tetramine and synthetic resins produced therefrom.)

Class A

Public and industrial heat, light, power and water equipment
Transportation equipment — including accessories to commercial airplanes
Trucks, buses, tractors, firefighting and farm implements
Technical instruments
Material and equipment for scientific research
Chemical protective uses
Applications in the communications industry (telephone and telegraph)
Industrial equipment
Oil well equipment
Housing, other than protective coatings
Mining
Industrial, food and medicinal containers, and protective coverings therefor
Closures, except decorative
Marine applications
Grinding wheels and other abrasives

Class B

Tables and kitchenware, save as expressly classified under C
Protective coatings not otherwise specified
Radios
Household appliances
Textile finishing
Domestic wiring devices
Passenger automobiles
Buttons
Brushes
Furniture
Pipe stems
Commercial cameras and other commercial photographic equipment
Articles fashioned from standard casts by hand operations

Class C

Amateur cameras and other amateur photographic equipment
Hardware
Smokers' articles, except pipe stems
Decorative articles, vases, bric-a-brac, not otherwise specified
Tumblers, cups and plates
Premium and advertising items
Novelties, not otherwise specified
Buckles and findings, not otherwise specified
Displays
Escutcheon plates
Picture frames
Toys
Games
Phonographs
Minor utilitarian items easily substitutable —bookends, stationers' articles, mechanical pencils, and the like
Articles or uses excluded from Classification (a) and Classification (b)

The significance of this situation should be plain to all users of finish materials of a synthetic nature. They must lose no time in classifying their use of finishing materials under A, B or C, or consider possible substitutes. The smart operator will do both. He will then be in a position to help his finish supplier to obtain resin supplies under classifications A and B.

If the finish supplier cannot obtain enough resin to take care of all the demands under A and B, then the finish user will be informed early enough to be reconciled to the use of an inferior substitute. Be prepared to help your finish supplier obtain the allocation of available resin which he needs to manufacture your finishes. If he asks for the information in a sworn statement, comply, as you help make his position stronger.

It has been noted and will be noted many times again that some of the largest users of finishing materials are the least willing to recognize that there is a shortage of raw materials, and they have often been quite critical of their suppliers when deliveries were slow (as the result of these shortages). These large users should realize that many of the salesmen calling upon them do not know how serious the situation is, and even some of those who do know will take an order whenever they can get one and leave it up to the house to fill it. Naturally, even in these times, an initial order from a desirable account is treated with considerable respect by the finish supplier, even though he may not know where he is going to get the raw materials to produce it—or he may even consider short-shipping an old customer.

This is mentioned in order that the finish user should not be deceived by the fact that he may be

able to go to a new supplier and obtain an initial shipment when his old supplier was unable to ship. The user will just be that much later in realizing the true situation.

The foregoing is, in view of what could be written, an extremely brief description of what the finishing industry must prepare for. Aside from complying with the civilian allocation program as outlined, there are many ways in which the individual user of finishing materials can improve his own position, both as to supply and in general all-round economy. The remainder of this article will go into these matters.

The shortage of iron and steel has made it quite difficult for finish manufacturers to obtain all the steel kits and drums they need. Many are now offering much more than junk prices for the return of one-time shipping drums, and are paying the return freight besides. Aside from the price paid for returned drums, users should cooperate, as the manufacturers cannot ship finishes if drums are not available. By properly agitating material received in drums, keeping drums tightly closed when not in use, and by properly closing them when empty, the user not only returns a drum that is easy to clean, but he makes sure that all the pigment value is obtained from the paint—and he eliminates "skinning" in the drum. Don't forget that drums easy to clean do not benefit the finish manufacturer alone.

Lacquers and lacquer thinners have always been comparatively expensive and are becoming more so. From the standpoint of supply, we know that some deliveries have been slow and in the future there may be allocation. It therefore behooves every user to make sure that these materials are being used to the best possible advantage. Check closely on the amount of reduction you are giving to your lacquers. Adjustment of all spray guns, pressure and volume of air, and reduction of material must all be coordinated. Get the help of your finish supplier's service man and consider the use of a new modern spray head on that old spray gun.

Do you use lacquer thinner as a general all-round cleaner in your paint shop? There is no sense to it if you do. For cleaning spray guns and for washing off badly sprayed pieces, use the same thinner you use to reduce the material. For old-style materials, use varnolene or safety solvent; for synthetics, use Solvesso No. 2 or No. 3 or coal-tar solvent; and for lacquers, use the cheapest lacquer solvent you can buy. Much lacquer solvent now used for stripping dried films can be conserved and money can be saved by using chemicals in a steam-heated stripping tank. This has been covered several times in previous issues by a number of writers. There are firms advertising in INDUSTRIAL FINISHING *that* can give you complete details on these methods.

Those of you who have ovens and are now operating upon schedules of from 10 minutes at 350°F. to 30 minutes at 225°F., should give careful consideration to arranging production and oven temperature to permit bakes of 60 to 90 minutes at 450°F. down to 90 to 120 minutes at 250°F. Synthetic resins make possible the quick low-bakes now so popular. With allocation of synthetic resins now being practiced it is absolutely essential that manufacturers in Class C put themselves in a position to

(Continued on page 82)

BY R. C. GROWS
Manager of the Globe and Map Mounting Departments, Rand McNally & Co.

Making and

THE IDEA of a globular earth was accepted by geographers of antiquity with some hesitancy. Thalis, 640-548 B. C., one of the earliest astronomers, supported this theory. Early globes were chiefly the work of astronomers. Some of these first known globes were struck from brass or silver; others were painted on glass and even carved in marble.

It was not until about 1514 that globes were mounted with map gores. This method, using 12 separate gores, is still in use today on all hand-mounted globes.

The most notable achievement in globes, in recent years, has been the improvement in mechanical construction and general design. The skeleton frame work of all non-metal globes is made by gluing together two pieces of cardboard, which have been die cut and then formed into hemispheres in a large press. The outer surface is then coated with several layers of plaster covering all the joining ribs. After several sanding operations, the surface becomes smooth and clean.

Because wet plaster is largely composed of water, it not only shrinks considerably in the drying-out process but re-absorbs moisture and expands in a highly humid atmosphere. This continuous cycle of expansion and contraction makes it impossible to control or stabilize uniformly in spherical dimensions. In calipering plaster balls we have found dimensional

nd Finishing World Globes

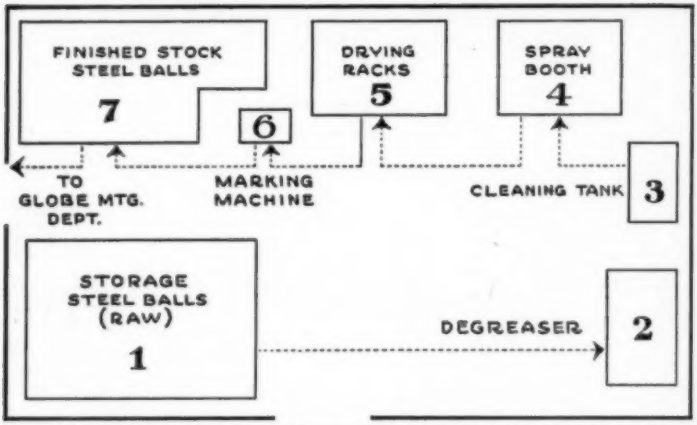
variances of ⅛-in. or more. The greatest problem confronts the map mounter who must apply the gores to this irregular sphere. Sometimes valuable portions of the gores must be cut away, in fitting and matching the maps together, and again the paper must be stretched to fill in a possible gap.

To overcome these difficulties Rand McNally experimented with many different materials for globe construction. It is now over two years since we introduced the new steel globe. This steel sphere is mechanically drawn from special deep-drawn cold-rolled steel. It must not be confused with a metal spinning, as spinnings are no more accurate than plaster balls.

The steel idea is not entirely a new one. Others have tried it before, but failed either to conquer the rust problem or to evolve a suitable method for joining the hemispheres, whereby the resultant seam would not be visible. Steel hemispheres, properly joined, form a true spherical unit with dimensional tolerance of not more nor less than .015625-in. A ball, so constructed, will always retain its true size and shape regardless of weather conditions.

Our gores, or maps, are mechanically die-cut to fit the steel ball perfectly. An experienced mounter applies them easily, with none of the makeshift fitting formerly necessary.

The operation and layout chart, that accompanies this article, il-



Layout chart showing the sequence of operations in preparing steel balls for covering.

lustrates the various steps involved in processing and conditioning the steel balls. Our operation layout is planned along straight-line production. Each separate work station is arranged in proper sequence. The steel balls move along in systematic order, eliminating all unnecessary motions.

There are 15 distinct operations required in processing the balls. The major operations include unpacking, inserting rod, placing on conveyor rack, degreasing, removing rust, spraying with anti-rust paint, drying, marking and repacking. Our time study standard on the complete cycle of all operations is 8.35 minutes per ball, not including drying time.

Analysis of Various Operations

The steel balls come to us packed in individual cartons economically designed for re-use. The raw ball is protected with a heavy film of rust check. This is applied to prevent corrosion and to preserve the steel during transit and future storage.

To condition the balls, they are removed from the carton, rods are inserted through the two polar openings, and the balls are hung on movable conveyor racks which act as carrier for the various operations. About 12 balls are placed on each rack. The grease film is removed by immersion in the degreaser. Three 12-in. balls are hung at a time. Before the ball goes into the degreaser, a special small tapered sleeve bushing is slipped over the rod. This fits snugly around the rod and seals the opening, preventing the liquid vapor, trichlorethylene, from going inside the ball, thus avoiding needless waste of this expensive solvent.

Degreasing by modern methods, we have cut time down to one half, as compared to the hand method operation formerly employed. Our machine method guarantees 100% grease removal, whereas the hand

One look at Boulder Dam tells the story more than hundreds of words of description. • One look at the finish on furniture, radios and pianos, or any finished surface, tells the story, and it tells a story that either sells your product or does not sell it. • 87% of all first impressions depends on what is seen. And first impressions *count!*

LACQUERS, SEALERS, STAINS, ENAMELS, FILLERS

STILLE-YOUNG

MANUFACTURERS • CHICAGO

KNOWING IS BETTER THAN GUESSWORK

Hail to th

No wonder Army experts today hail the Half-Trac as superior to any comparable vehicle of any other nation. It makes up to 50 miles an hour over soft and broken terrain, smashes through brush, timber, streams, or thirty inch mud, climbs six foot trenches, and hauls artillery when needed.

And no wonder The White Motor Company, in the new finishing plant it has built for these remarkable scout cars, has installed DeVilbiss Spray Systems to give them their regulation finish of Army drab paint. Spray painting and exhaust equipment, hose, hose connections and accessories—all are DeVilbiss.

White's forty years' experience building trucks, busses and White Horses, which is enabling it to break all production forecasts on

Half-Trac!

Half-Tracs, convinced it that modern DeVilbiss equipment can be relied upon to meet both top-speed assembly schedules and exacting Army finishing requirements.

Innumerable other leading companies, whose experience in peacetime production is now being devoted partly or wholly to national defense, have also standardized on DeVilbiss for product finishing and plant maintenance. By so doing they make certain that these operations will always keep pace with peak production needs, in speed and quality of work.

THE DEVILBISS COMPANY • TOLEDO, OHIO

Canadian Plant: WINDSOR, ONTARIO

DEVILBISS SPRAY SYSTEMS

This is what we mean by A COMPLETE FINISHING SYSTEM *engineered* to the customer's specific demands

Producing modern finishing equipment is only part of the job undertaken by Mahon engineers. They plan and place this equipment to meet plant and product conditions.

For example: In the Complete Finishing System just completed for the Heywood-Wakefield Company, Gardner, Mass. (pictured herewith) it originally was contemplated to use either oil or gas for oven heat. But our survey disclosed it to be more satisfactory to use high pressure steam heat, which eliminated fuel tanks, reduced initial installation costs and lessened year-round operating expense. Likewise, the dry-off oven was so located that space previously considered useless was put on a paying basis.

If your *finishing* operations require modernization, Mahon experience and knowledge undoubtedly can save you money, too.

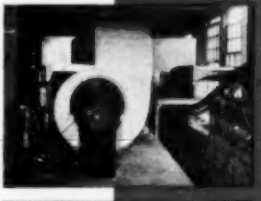
THE R. C. MAHON COMPANY
DETROIT • CHICAGO

Designers and Manufacturers of Complete Finishing Systems, Metal Cleaning Machines, Rust Proofing Machines, Hydro-Filter Spray Booths, Ovens of All Types, Filtered Air Supply Units, Hydro-Foam Dust Collectors, and many other Units of Special Production Equipment

Conveyor entering 3-stage Washing and Drying Unit. Washing Machine exhaust fan and Oven heating system is located under ceiling.

Washed and Dried Parts emerging from Dry-Off Oven. Note that this Oven is located between two buildings in previously wasted space.

Painting department. At extreme right Flo-coat and Touch-up work. Conventional Hydro-Filter Spray Booths. Left, Parts descend to bottom of Baking Oven.



Parts entering the Baking Oven. This Oven is unusual in that course of load is super-heated steam with a low temperature of 250°, automatically controlled by air-operated valve.

Cooling conveyor, head of Oven and starting system. Overall length of Oven 90 feet. Cooler is separately operated. Normal operating temperature of 350° is maintained within 10 degrees of starting system.

MAHON

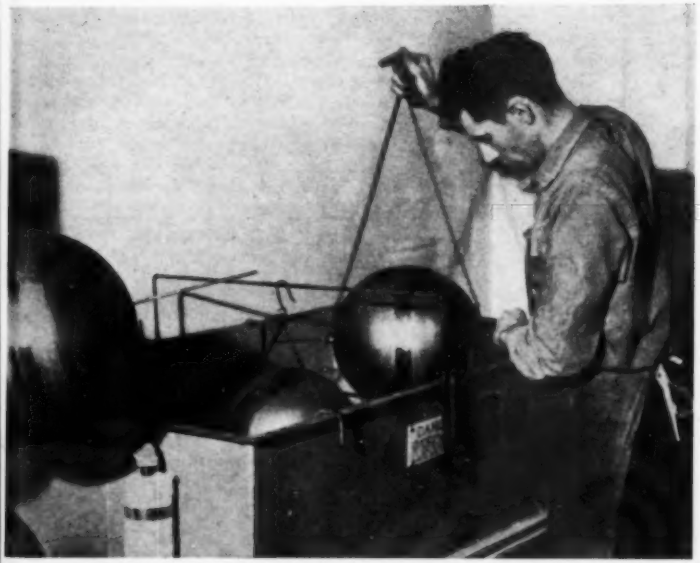
method is unreliable. Removed from the degreaser, the rod is still in the ball, but the bushings are removed; also the special hanging fixture on which the balls are suspended while in the degreaser.

The next step is to inspect the balls for rust and other imperfections. If any such are found they are quickly and easily removed with metal cleaner, while the ball is still warm. After the ball has been completely dried, it is immediately sprayed with a special anti-corrosive paint, which hermetically seals the surface. The sprayed balls are now hung in permanently fixed drying racks. Here they remain for 24 hours. This period of drying allows the pores of the steel to become impregnated with the coating and provides a durable permanent surface.

After drying, the balls are put in the marking machine. This device was designed and created by us. It accurately inscribes the parallel and meridian lines on the surface of the ball. Two operations are necessary but the ball always remains in a fixed position. For marking, a very fast-drying ink is used. These marked guide lines must register perfectly accurate, for they serve as guides to the mounters who apply the gores. They further guarantee uniformity in workmanship. When inscribed, the balls are packed and put in stock, ready for future mounting.

Our Early Research Work

At this time it may be interesting to tell you something about our early research work in developing the steel ball. Over six months'

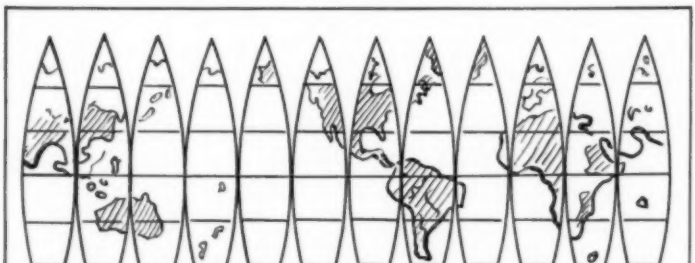


The raw steel globes are chemically cleaned by submerging them in a degreasing solution.

time was required to design and make the necessary tools and dies. Our next problem was rustproofing and preserving the steel. Electroplating and numerous treatments, including cadmium, were tried. While some of these showed promising results, the cost of each was prohibitive. In the field of lacquers, varnishes and other antirust paints, we did a vast amount of experimental work. In excess of 100 varieties of coatings were tried. In all of these experiments the balls were completely cleaned before coatings were applied; likewise, each ball was mounted with the map and the usual protective top coatings were sprayed on to finish the ball completely.

As time alone could illustrate results from these reaction tests, we thought it unwise to use artificial methods and accept finding that would be questionable. All the globes which survived a year's test and checked up satisfactorily were sent to a Southern Tropical Testing Laboratory to undergo additional exposure. We were much interested in the effects of various climates upon the balls being studied in the tests, such as salt water reaction and excessively humid atmospheres. Each globe was catalogued and the complete individual records of all occurrences were recorded from monthly reports furnished to us. An additional year of observation seemed to afford ample time for conclusive findings, after which the globes were returned to us for final decision.

"Our finishing problems, as related to world globes and maps, offer something entirely different and should be of interest to the trade."—R. C. Grows.



Twelve color-printed die-cut gores, barely joined at the middle, cover the steel globe.

What we have wanted was a neutral coating, one that would resist corrosion, one that would not discolor or fade the delicate printing inks of our maps. It was equally important that we be able to continue using our regular special wheat paste for the adhesion of the gores. Some of the coatings used in our experiments required the addition of stronger chemical ingredients, such as acid citric to this paste. Results of such additions often caused discoloration; also, they made the paste more difficult to handle and, in some instances, these chemicals would affect the mounters' hands.

Today we are producing both 12-in. and 16-in. steel globe balls, no heavier than our old plaster ball. The chief advantages of steel over plaster are its true spherical form, no breakage hazard, no loosening of plaster or separation of hemispheres.

Preparation of the Gores

All of our map gores are protected with a roller-coat surface of special flexible lacquer. This coating protects the map's surface from rubbing and any possible injury to the prints, while they are being applied to the balls.

In order to obtain uniformity in color distribution and correct register in printing, all work is done in humidity-controlled work rooms. To further insure correct ink distribution, all 12 gores (the number necessary for each globe) are printed at one time, arranged in vertical order on a single sheet of paper, as shown in the illustration. Similarly, the machine die cutting is performed in one complete operation. A small tick at each extreme end of the gores, keeps them intact so that they do not drop out of the sheet after it is cut.

The die-cut sheets are next wrapped in packages of 200 complete sets. These are sealed so that no moisture can penetrate through them. Ten packages are then put into a heavy wooden storage box. All boxes, so packed, are placed on end to eliminate weight and pressure on the printed surfaces.

By exercising such extreme care in all of our preparatory processes, we are able to control the uniformity of our material, thus attaining a high degree of perfection in assemblage.

Retouching and Lacquering the Globe

After the ball is completely mounted, it is ready for final inspection. Frequently, in the printing, one gore may be slightly deeper in tone than another corresponding one. Such a condition is very noticeable in the completely mounted ball. This can be taken care of, as are any other imperfections, by means of retouching by hand. Special water colors that match the original printing inks are used.

The globe is now ready for its protective top coatings. The purpose of these coatings, which are sprayed, is to provide a surface that is durable and also washable. Hereafter, when the globe becomes soiled or spotted with finger impressions, it can be safely washed with warm water and mild soap. This operation would be hazardous to a hollow plaster ball because of the moisture absorption.

With every possible precation taken to produce globes of accuracy and durability, we offer a wide variety of sand models on which to mount them. Whether for private or public use, we can furnish the globe on a stand to meet any occasion or demand.

Infra-Ray Baking Solves

BY H. H. SLAWSON

INFRA-RED drying lamps, used by Meyer Mfg. Co., Chicago, Ill., to bake synthetic varnish on metal bases and shafts of floor lamps, seem to have solved one of the company's production problems. Since the fall of 1940, when a battery of 40 infra-red drying lamps was installed in the plant, the company hasn't had a lamp returned due to corrosion caused by the action of potassium cyanide* on the metal and finish. The elimination of this source of waste, according to Mr. H. B. Meyer, president, has in a year's time paid the original cost of this modern equipment several times over.

Typical Finishing Troubles

Mr. Meyer, who has been active in the lamp manufacturing field for 20 years, established his present company in 1939. Metal bases and shafts of his products are electroplated to produce silver, bronze, brass and other metallic finishes. Formerly they were given a protective coat of clear air-drying lacquer. When relative humidity was high the drying slowed down considerably and the final result was often largely a matter of luck. Slow-drying of the finish also caused bottlenecks in production schedules which created other complications in the company's operations.

Among other things the company was bothered with a sort of corrosion caused by slow reaction from traces of potassium cyanide which is used during the electro-plating process. The rejects, caused by corrosion, were too numerous. Sometimes the trouble began to show up before completed lamps left the shop. More commonly, though, lamps that had been shipped in perfect condition, would come back after a month or so, bearing the spots and discolorations developed by the action of the cyanide.

Apparently the cyanide was dormant for some time; then, gradually it worked its way from the pores of the metal, while at the same time the protective film of lacquer was weakened. Finally, when air could reach the chemical, its action increased in speed. This trouble seems to be common in the lamp manufacturing business and has always been one of the industry's sore spots.

Infra-Red Baking Tried

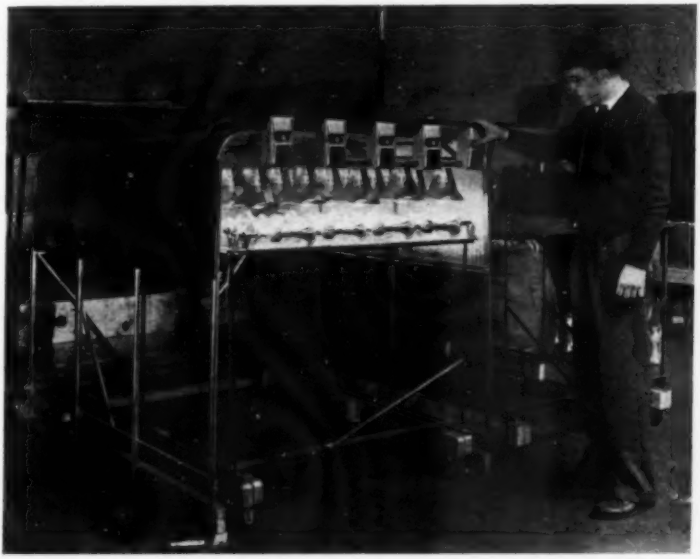
Learning of the Ford Motor Co's. use of infra-red heat for drying the finish on automobile bodies, Mr. Meyer became interested in the possibility of applying the process in his own plant. An investi-

*Potassium cyanide is used during the electro-plating process. It is an essential part of the process. The metallic substance, say, silver, which is to be deposited on the iron surface, is dissolved in a tank of potassium cyanide. Then, as you know, an electric current is sent through the solution. As I understand it, nothing else will do except potassium cyanide. It insures a thorough adhesion (or do they call it "bonding") of the silver to the iron, which cannot be secured by use of other chemicals.

My notebook contains the following: "Cyanide sealed in with lacquer. Dormant one to two months. Eats way out. Spot grows when exposed to air. Rays absorb hidden cyanide . . . penetrating power."

Those last words, "Penetrating power," may be the key to the results he gets. It was his suggestion and the literature I have read also speaks of the ability of the rays to penetrate deeply.—The Author.

Lamp Production Problem



The clear varnish on plated lamp bases is dried satisfactorily under infra-red lights.

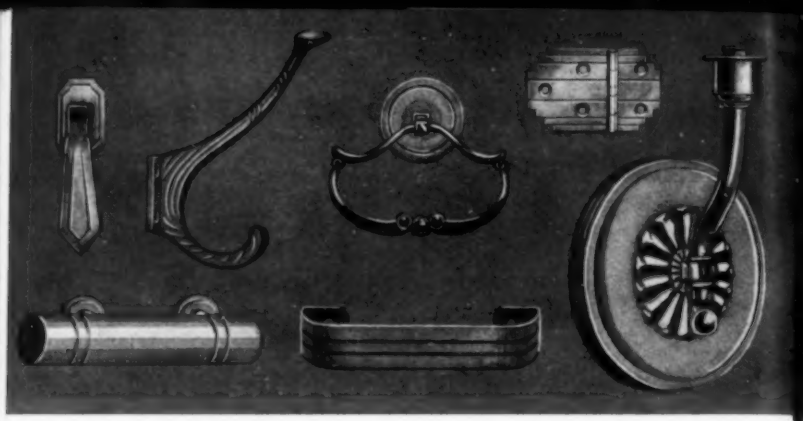
gation followed, with the result that a new drying unit was constructed and installed in the company's own shop.

The 40 light bulbs used are of 250-watt rating each, and they are equipped with Alzak reflectors. They are arranged in five rows in the oven, each row being controlled through a separate switch, so that if the oven's full capacity is not being utilized, no power need be wasted.

Work to be dried is placed on a table constructed of light sheet-metal and angle iron, and having casters to permit easy mobility. Lamp parts placed on the table's top for baking are just 8-in. from the light source—which has been fixed as the ideal distance for best results on this job.

Clear Varnish Used

Now the clear synthetic varnish is baked in from 25 to 30 minutes, regardless of humidity or other weather conditions. The finish is a clear urea-formaldehyde varnish which, when dried, produces a film that does not dim the luster of the metal. At the same time, it turns out tough and hard and is much less liable to scratch or mar than an air-dry coating. *(See p. 73)*



Color-Finishing Brass to P

BY HENRY H. HIGERT

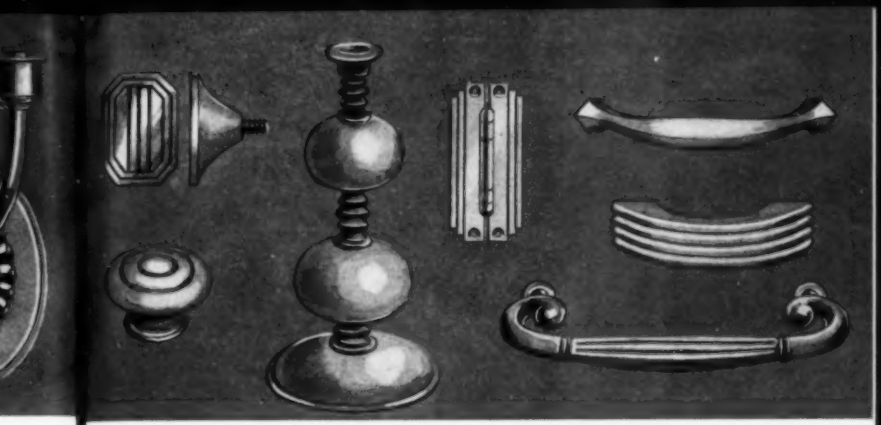
IN ORDER to proceed correctly with any process one must first understand the fundamental requirements. Fundamentals are the phases which, when altered, will likewise alter the ultimate results. The first fundamental in all surface coloring of any kind or nature is cleanliness.

Cleanliness in processing means the elimination of any foreign substance that may alter a result. The fundamentals of finishing brass to produce attractive antique effects are: 1) cleanliness, 2) solution composition, 3) base-material composition, 4) base-material structure, 5) background color, 6) background structure, 7) background tone, 8) relief (highlight) tone, 9) relief (highlight) color, 10) corrosion protection, and 11) wear protection.

Genuine antique brass would be a close simulation of brass that had become corroded by atmospheric or chemical contacts from outside exposure or from burial underground. Genuine antique imitations are somewhat dull or soft-toned. In this article I will deal first with processes for producing the "genuine" antique simulations, and secondly the "color" finishes.

Cleaning the Brass

Brass that has been exposed for any great length of time, or that has been handled, is more or less oxidized; or it may have oil or grease on its surface. If the brass has been protected from exposure by a coating of lacquer, that should be removed. The safest and best procedure is to immerse all brass (lacquered or not) in a mildly alkaline cleaning solution, which should be kept at a temperature of from 180° to 212°F. Any good standard brass-cleaning solution may be used. Five to ten minutes of immersion should be sufficient to



to Produce Antique Effects

remove any grease or coating of lacquer. Then immerse in a solution made up in the proportion of 6-oz. of sodium cyanide to one gallon of water. This can be used at room temperature.

At this point it will be well to state that two things are necessary to make any chemicals active. The first is moisture and the second is heat. A thoroughly dry chemical will not act at all, and a cold wet chemical will not act as rapidly as it would if it were warm or hot. Always keep in mind this temperature angle and, if any solution is acting too rapidly, first reduce the temperature before reducing the chemical content. Immersion in the cyanide solution removes any oxide that may have formed.

Colors Produced by Exposure

Before looking over any formulas it should be understood that chemical reactions from atmospheric exposure or direct contact with moistened chemicals in the earth might, over a period of time, produce any of the following colors by oxidation: golden yellow, tan, brown, grayish green, black, green. The first three would likely come from contact with the same chemical, the difference in color depending on the length of exposure. Likewise, the latter three would result from contact with the same chemical or chemicals, and varying lengths of time would produce the colors in the order named.

The solution identified as Formula 1 will produce the first three colors just named, the color being dependent on the temperature and the length of time of immersion. Please remember that agitation provides more rapid action and uniform distribution, therefore the articles should be kept in motion while immersed.

Formula 1, Yellow-Tan-Brown Solution

Golden antimony sulphide	(oz.)	4
Caustic soda	(oz.)	2
Water	(gal.)	1

Thoroughly fix in your mind the fact that oxidation is a transformation of a part of the base material, brought about by chemical reaction through bringing into contact chemicals—oxygen and metal. The rapidity with which brass is colored chemically depends upon the strength of the solution and its temperature. Too rapid transformation produces insecure spongy coatings. The slower the action the more secure the coating. Never increase the solution's strength. If this solution is used at full strength and very hot, the color will go from yellow to tan to brown very rapidly, therefore if either of the lighter colors are desired, decrease the temperature.

"Fixing" the Color

A further aid to help fix the color at a certain stage is to dip the articles directly, without rinsing, into a solution made up in the proportion of 2-oz. of copper sulphate to one gallon of water. Always remove the metal as soon as the desired color appears (or, in some cases, slightly before) and rinse it immediately in clean hot water. Then dry the metal at once in dry (preferably hot) fine hardwood sawdust or cob dust. (Cob dust is more absorbent and contains no chemicals that might change the action.) Almost invariably, the color will be slightly darker after rinsing and drying than before, therefore, a little practice will be needed to obtain a certain shade.

Yellow; Brown; Black; Green

I have developed a special solution which, in conjuction with other materials and procedures mentioned later on, will provide golden yellow, tan, light brown, dark brown, black and verde green.

Formula 2, Special Solution

Yellow barium sulphide	(oz.)	3
Polysulphide	(oz.)	3
Sodium hydroxide (caustic soda)	(oz.)	6
Ammonium Hydroxide (stronger ammonia)	(pt.)	½
Water	(gal.)	1

Use this at room temperature and half strength to produce yellow, tan or light brown. To obtain the dark brown, immerse brass articles until rainbow colors appear; then rinse thoroughly in hot water, and dry. Let them set for half an hour or more; then re-immerse them. Or, oxidize to rainbow colors; then rinse and dry. Brush as per instructions later. To obtain black, immerse the brass until it shows a blue black; then rinse and dry. Protective and other applications given later will provide the dense black.

Composition of Brass Affects the Colors

Brass can be and is of different composition. It is what is called an alloy made up of zinc and copper. If it is cast from scrap metal, certain impurities may be present which will affect its coloring by oxidization. Whether rolled (sheet brass), extruded (rods, bars and tubes) or cast, the composition may vary from 35% zinc and 65% copper, to as little as 15% zinc and as much as 85% copper. An estimate of the proportions can be made by observing the color; the lighter the color, the higher the percentage of zinc content. The higher the zinc content, the longer it takes (and the hotter the temperatures required) to change the color, because it is the copper that takes the color, not the zinc.

Both electro-plated and cast brass may be of uneven or varying composition. In such cases it is practically impossible to get uniform oxidized colors. The only real

remedy is to get better plating or better castings. Keep in mind that parts of different composition can not be oxidized at the same time to get the same results. The more dense the structure of the base material the slower the action of the oxidizing solution. Rolled brass and extruded brass are the most dense.

Brass-plated coatings come next. However, there is even a difference in the structure of plated coatings. Cast brass has the coarsest structure; that is, it is the most porous. There may be a difference in the structure of a single piece or different pieces of the same lot. Keeping this fact in mind, you can readily understand why sheet brass or extruded brass should not be oxidized along with plated or cast brass—nor should either of the latter two be treated at the same time, because the more porous the structure the more rapid the action. It is possible, though, to get a smooth nearly-uniform coloring on any of the structures by the following procedure:

To Produce Satin Finish For Antique Brass

If a rather soft satiny finish is desired, then after the cleaning, rinse thoroughly in clean cold water; do not dry; then scrub with a tampico brush or buffing wheel rotating at 600-r.p.m. Use a compound consisting of water and pumice stone or ground quartz, keeping the lines always running in the same direction. Then oxidize, rinse in hot water, and dry. After drying, brush gently with a fine steel-wire brush or wheel rotating at 1000-r.p.m.

Always run the wire wheel or wield the wire brush in the same direction so that the "bristles" will not become sharp and scratch the treated surface. If the color is not deep enough or not entirely uniform, repeat the oxidizing, rinsing, drying and brushing until it is. In other words, do not remove the oxide but wire-brush the surfaces and then re-oxidize.

If a smooth, lustrous oxide coating is desired, instead of using the pumice buffing operation, after cleaning rinse the brass surfaces in cold water; then in hot water; then dry them. After drying, brush the surface with a fine wire brush or wire wheel. Repeat as outlined above, if necessary. Dip the brush in a cleaning solution to prevent it from rusting. Since the oxide consumes some of the coating, it is necessary, with brass-plated coatings, to have a more than ordinary thickness of deposit for oxidized or antique finishes.

If the brass plated coat is too thin you will find it impossible to get a dark color, therefore you gamble whenever you purchase brass-plated parts for antiquing, especially so if they have been finished in some manner before. Brass-plated coatings should be oxidized directly after being rinsed in cold water.

Ball burnishing or other barrel tumbling may be substituted for brushing when you have quantity production of comparatively small articles.

The background color, as heretofore stated, is the oxide formed by the chemical. When brass has been exposed to the atmosphere or in contact with the ground for a long time, under conditions wherein the chemical action has been so severe as to cause rapid corrosion, the resulting oxide coating may be spongy, thick and easily rubbed off. The same condition occurs when we use prepared solutions that are too strong or too hot, and when the

action is permitted to penetrate deeply. In order to simulate the soft, spongy effect and still make it wearable and reasonably uniform, the oxidation of the surface must be planned to take place in a practical manner and then combined with a protective coating, as explained later under that heading. The color of the background will be affected by whatever material is used as a protective coating.

The tone of the background may be smooth and lustrous or soft and spongy, or it may range somewhere in between these extremes. Also, the tone can be made smooth satin instead of lustrous. The "in-between" tone is obtained by oxidizing the material "as is," after cleaning; in other words, without brushing, burnishing or buffing. There is no treatment required after coloring except the application of the protective coating. It is difficult to get a uniform background by this method since there may be different structures in the base material—and further, all of the oxide may not have been removed. The smooth and lustrous effect is obtained by wire brushing the surfaces both before and after coloring, as heretofore explained. The smooth satin effect is obtained by brushing with pumice, etc., before oxidizing. The soft, spongy effect can be obtained only by subsequent application, as will be explained later.

Bright Dip Treatment

There is an opinion prevalent among many metal finishers that brass castings must be bright-dipped before oxidizing. This is not necessary nor even advisable if the castings have been properly made. However, sometimes it happens that sand and oxide will be so badly burnt into the castings that such treatment does become necessary.

If treatments outlined heretofore will not remove the sand and oxide scale from the background, then the castings can be dipped in a composition made up according to the accompanying formula identified as "Bright Dip for Brass." Dip and rinse immediately in clear cold water. Repeat, if necessary, and then oxidize without drying. The fumes from the bright dip are poisonous and must not be inhaled. They are also corrosive, hence such work should be performed only where there is excellent ventilation —and away from other work or material of any kind.

Formula 3, Bright Dip for Brass

Sulphuric Acid	(gals.)	2
Nitric Acid	(gals.)	1
Water	(qt.)	1
Hydrochloric Acid (Muriatic)	(oz.)	½

(Use this solution cold)

If, for any reason, too much muriatic acid has been added to the solution at any time, the work will come out "sooty." In this event, add a small amount of sodium chloride (salt) slowly. Add enough salt to return the solution to proper balance. Use only the exact amount of water specified in the formula; do not get any more in the dip.

Formula 4, Matte Dip for Brass

Sulphuric Acid	(gal.)	1
Nitric Acid	(gal.)	1
Zinc Oxide	(lbs.)	2

(Use hot and keep free of water)

If the action is too coarse, add sulphuric acid. If too fine, add nitric acid.

Semi-Lustrous Matte Dip for Brass

Sodium Dichromate	(oz.)	3
Sulphuric Acid	(pt.)	½
Water	(gal.)	1

Both solutions are poisonous and corrosive. Handle with extreme care.

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Producing Highlighted Effects

The tone of the exposed metal may be smooth and lustrous, dull and satiny or bright and satiny. To produce a smooth and lustrous tone requires preliminary polishing or burnishing of the highlighted portions, followed by rubbing with a cloth and buffing composition, after oxidizing and drying. The dull and satiny effect is obtained by rubbing the surface with a wet cloth and pumice, or tampico wheel and pumice. The surface is then rinsed in cold water or hot water and dried in cob dust, sawdust or by a dry cloth. The rinse water must be clean and free from mineral content, and the drying must be done immediately, or tarnish marks from water will appear. If the drying follows a cold-water rinse, there is less danger of water marks.

The bright satiny effect is obtained by rubbing the surfaces with cloth and emery, or by using a buff wheel and greaseless buffing compound. Rubbing or buffing marks should always run in the same direction. They may vary from fine to coarse, according to the grade of abrasive used.

Highlight Colors

Often it is desired to have the highlight tones some particular shade, such as yellow gold, red gold or bronze. Many other tones may be produced to match particular wood or metal finishes, but those I will not mention at this time, since the genuine simulation would include only the three just named.

The true antique simulation has no lacquer coating. However, to minimize the expense of using such costly metals, yellow brass may be used and then sprayed with lacquer tinted to any of the shades desired. The last application, under the heading "Corrosion Protection," will tone down the lacquer effect to where it is hardly noticeable. The color of both the background and the highlight will be changed somewhat by the use of protective coatings. A thorough explanation, as to cause, effect and procedure will be explained under that heading.

Protection Against Corrosion and Service

In ancient times it was the practice to oil or wax metals for protection. An antique would be cleaned off as much as desired by abrasive action, then oiled or waxed, and the highlight rubbed dry or nearly so. However, as explained heretofore, the background was seldom uniform as to color or texture, therefore it was not so attractive.

We can get the effect of extreme age as follows: If only the brass color is desired, coat the object (after it has been rubbed with abrasive) with a special material called "overspray." Allow this coating to dry only partially. Then rub off, as desired, with a soft cloth.

Sometimes it is advisable to protect antique finishes against both wear and corrosion to a greater extent than an oil or wax coating would afford—especially if the articles are made of brass-plated steel. This objective may be attained by first spraying the surfaces with a thin coat of flat lacquer and then, after the lacquer coating has thoroughly dried, apply the "overspray" and wipe part of it off. If there is no recessed background—that is if the article is flat and smooth—and it is not desirable to change the color of the oxide coating appreciably, then, in-

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NO TAMPERING WITH QUALITY

stead of using the "overspray," apply a coating of ordinary floor wax. When this wax coating becomes nearly dry, polish the surface with a soft cloth.

Any protective coating, whether it be oil, lacquer or wax, will change the color of the oxidized surface slightly. It darkens the surface somewhat, therefore some experience and skill are required to produce specific results. This completes the "genuine" antique simulations.

There are other finishes that are called "antique," but they are really not antique. A number of them are obtained by following the instructions described in this article, to the point of highlighting, and then coating the surfaces with lacquer only.

There are chemical solutions that will produce several different colors on brass including rose gold, verde green, tiffany green, green, blue, blue black and red. However, both the chemicals and the processes are expensive. The same or even better effects are obtained by using certain organic coatings which have been developed and which may be had at a fraction of the cost, both for material and labor.

SPECIAL NOTICE: Do not try to revive a used and oxidizing solution by adding chemicals. When it ceases to function as desired, throw it away and make up a new one. Water may be added to replace evaporation, but nothing else. Keep all foreign matter, such as dust, grease, other metal, etc., out of the solution. Cover the dip tank or container when the solution is not in use. Wire brushes and wire wheels (steel) should be dipped in the cleaning solution, then permitted to drain and dry naturally to prevent rust.

Shortage of Sprayers

HERE IS A TIP I would like to pass on for what it may be worth: For the past several months it has been quite a problem to get good sprayers and keep them. We pay our sprayers a fair wage, with any where from 12½ to 20 hours overtime per week.

Now my point is that they leave and get more money per hour, but less hours, some place else. It is questionable whether they have bettered themselves insofar as their weekly or monthly income is concerned.

I have found that by taking a man with reasonable intelligence and putting him at spraying small parts and the not-too-particular articles, I will have a fairly good sprayer within a few months.

Usually I stay with a new man and show him the proper way to handle the spray gun. Also, I explain to him how to take care of the equipment, such as cleaning guns, hose and pressure tanks. I also find that by breaking in a new man, in the course of a few months he adapts himself to our system of spraying and that helps to keep up our production schedule as well as keeping our cost down.

The company I am with is one of the largest in the business. It is practically a job shop; that is to say, we manufacture for others and not for ourselves.—J. G. S.

Since the start of the defense program, many manufacturers who had been plating and polishing after fabrication have adopted pre-finished metals. They have found that these metals, which require no plating or polishing, have helped them speed up production in their own plants.

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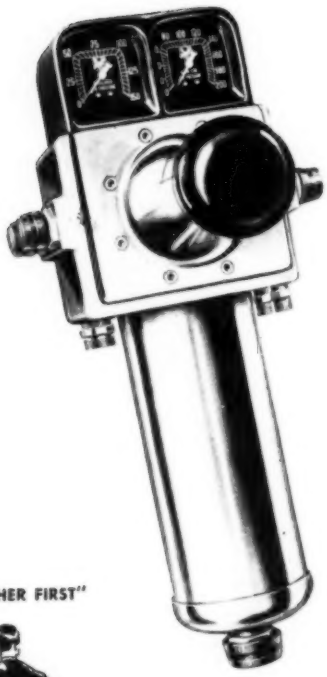

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Tumble Finishing

BY R. J. FAIRBURN
Zapon Division of Atlas Powder Co.

THE TUMBLING barrel provides an economical means of applying lacquer and other finishes to small parts. Not only is the handling cost kept at a minimum but a minimum of finishing material is used. Tumbling barrels, as a rule, are not costly and they do not require too much valuable floor space.

Briefly, the method is to partly fill a barrel with the articles to be coated. A small quantity of finishing material is poured over the work and the barrel is revolved until the surfaces of all pieces are evenly coated. In some cases the tumbled-on coating is allowed to dry before the coated articles are removed from the tumbling barrel. In other cases the coated articles are removed wet and spread out on trays to air-dry or to be baked in a drying oven.

On metal pieces, the quality of the finish often equals that of dipped or sprayed work. On wood, the finish is reported to be tougher because it is forced into the surface of the wood. The coating—if it has been properly formulated and is correctly tumbled—is thin and is not easily chipped off. Because of this thin coating, the finish does not always hide wood grain as well as a sprayed finish. However, it has a pleasing appearance that is not easily obtained by any other finishing method.

Tumble-Finishing Wood Articles

Practically any kind of wood turnings, such as small handles, beads, etc., may be tumble-finished. If the operator is skilled and a properly formulated tumble finishing material is used, certain types and sizes of flat pieces and irregular shapes may also be tumble finished.

Pieces with sharp corners are not well adapted to this method unless they are made of hardwood. The sharp corners will probably be worn off and, too, sharp corners are apt to dig into the sides of adjacent pieces and mar the finish. Wooden blocks, such as those made for children's play sets, are usually tumble finished when made of hardwood.

Any kind of wood may be tumble finished, but a hard, even-grained wood, with no sap streaks, is best. This is also true for dip and spray work. However, I believe it is probably more difficult to hide sap streaks and knot holes by the tumbling method. Usually the economy of this method will more than pay the difference in the cost of better selected wood.

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Tumbling Equipment

A closed barrel, mounted with the sides horizontal and the ends vertical, is preferable for most wood finishing. A round wooden barrel may be used. Such a barrel is often more efficient if cleats are fastened to the interior — cleats parallel to the shaft and spaced about 12-in. apart around the inside. These cleats will carry the work farther up the smooth sides of the barrel before it drops back and, as a result, you get better tumbling action. The object is to cause the work to roll over and over, with each piece constantly changing position. The constant rolling of each piece against its neighbor forces the finish into the surface of the wood.

An 8-sided barrel (octagon shaped) is usually the most efficient. In such a barrel the work is carried up nearly to the top of the barrel before it drops back. Each section should be about 12-in. wide inside.

If the barrel is too small in diameter, the work does not get enough tumbling action for a good finish. The barrel may be any desired length, for example, 3 or 4-ft. is a good size. One company uses barrels 5-ft., in diameter and 10-ft. long. Another firm experimented with barrels 18-in. in diameter by 2-ft. long, but found them unsatisfactory for even small batches of small parts.

One side or segment of the barrel should have a removable section—a door for loading, unloading and inspecting the work. Two doors should be available to fit this opening—a solid door and a screen door. The screen or wire mesh door is used when it is desired to sift sawdust out of the work or admit more air into the barrel. The solid, tight-fitting door is used while the liquid finish is being applied.

The barrel is mounted on trunnions or some suitable framework that has bearings for its shaft. It should rotate at a uniform speed of 25 to 40-r.p.m. A faster or slower speed does not give proper tumbling action.

Tumble-Finishing Materials

The tumbling method can be used to apply any one of several different types and kinds of finishes. For very high grade wood handles, for instance, it is common practice to smooth up the turnings and fill the wood by tumbling it with a liquid pigmented filler. The work is then usually dipped or sprayed to give it one or more coats of enamel, after which it is air-dried —or, for better work, baked.

For natural wood grain finishes, the work may be dipped in stain. Then it goes into the tumbling barrel for a coat of clear shellac or clear lacquer. The staining operation, too, is sometimes performed in a barrel.

Most enamel finishes are obtained by using a properly-made tumbling lacquer. These lacquer enamels are available in any desired color. Naturally, bright or dark colors give best results. Such colors as yellow are fair, but white, cream and ivory are not so satisfactory.

Tumble-Finishing Conditions

Any finishing operation is at its best when performed in clean dry air. A uniform temperature of 70° to 80°F. is ideal. Unless the lacquer, or other finishing material is stored in a warm room, all that is to be used in a day should be brought into the finishing room the previous evening, so it can remain there throughout the night. This

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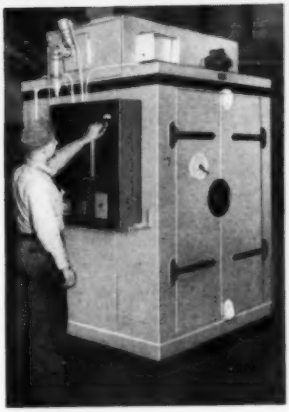

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N11G	8'-1"	4'-6"	4'-6"	5'-4"	3'-1"	4'-0"	915	90	120	170	110
N12G	8'-4"	5'-0"	5'-0"	5'-7"	3'-7"	4'-6"	950	100	135	190	110

ELECTRIC HEATED SHELF OVENS

CAT. NO.	OVERALL DIMENSIONS			INSIDE DIMENSIONS			APPROX. SHIPPING WEIGHT	MAX. K.W. CONS.
	HEIGHT	WIDTH	DEPTH	DOOR OPENING		DEPTH		
B11E	8'-1"	4'-6"	4'-6"	5'-4"	3'-1"	4'-0"	910	30
B12E	8'-4"	5'-0"	5'-0"	5'-7"	3'-7"	4'-6"	940	30

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But the Du Pont man wasn't! He kept coming around. And one day he proposed a system with one coat of white surfacer and one coat of enamel. They found the surfacer gave even greater hiding power and coverage—with a substantial saving in cost per gallon. So everybody's happy now!

And this kind of service shows why the Du Pont man who comes around is often considered "one of the boys" in the finishing department. He brings the sum total experience of skilled specialists—research chemists, laboratory technicians, production men, service engineers, field representatives—with the finest of facilities.

It is this *teamwork* coupled with years of experience which gives Du Pont that extra "know-how." That's why so many manufacturers turn to Du Pont for assistance in finishing processes. They know their problems are in the best possible hands . . . and that, as finishing problems arise in the future, Du Pont will be ready and able to supply the right answer.

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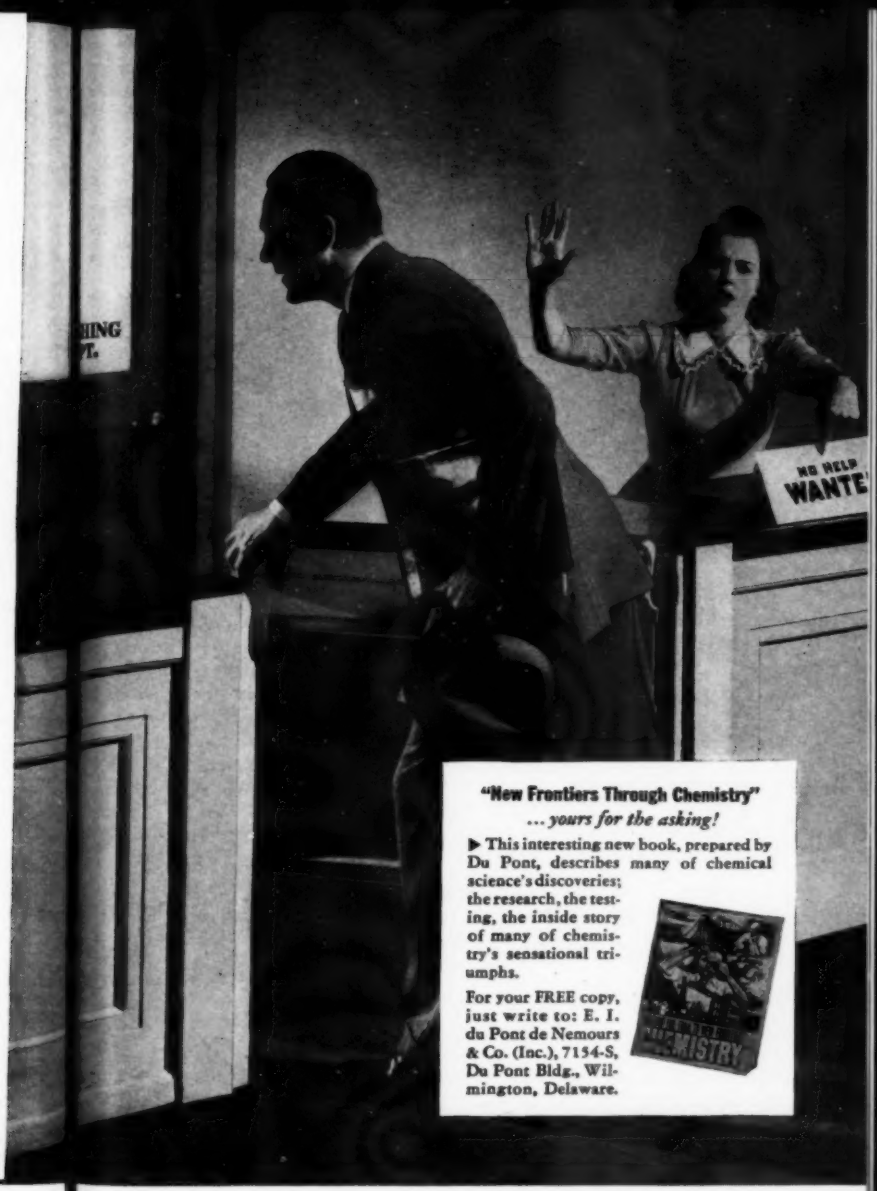

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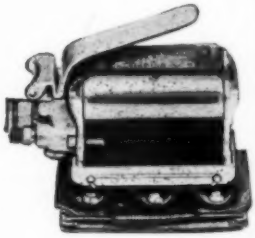
"SANDY" SAYS—

"A Good Man Is Hard to Get These Days!"



"Full speed ahead on production!" That's the demand of the day—but if you can't get GOOD MEN, how can you fulfill that demand? Well, one way is to eliminate "bottleneck" hand jobs such as HAND SANDING! For example, "SANDY" can do the work of THREE HAND SANDERS—and give you as fine a finished sanding job as you could want . . . because "SANDY" operates at 3,000—5/8" strokes per minute! That's why so many manufacturers in all kinds of industries have turned to "SANDY" to TRIPLE the speed of finish-sanding. We may be able to help you overcome bottlenecks caused by inadequate manpower, and thereby bring about IMPORTANT SAVINGS in your production costs. Put "SANDY" to work in your shop.

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will allow it to reach room temperature before it is used. A cold material does not flow well.

The manufacturer's instructions should be followed for stirring and thinning. The finish manufacturer finds that it is desirable to make tumble-lacquer enamels fairly heavy in body. There are two reasons for this. First, a heavier liquid will keep the solid part of the lacquer in better suspension. Second, a heavy material may be thinned in different proportions to meet varying conditions. Always use a good grade of thinner. The manufacturer of the lacquer knows what is in his material. He is usually the one from whom your thinner should be purchased.

The Tumbling Operation

Let us assume, as an example, that we are going to put a red gloss finish on several thousand small disc-like turnings. Each one is rounded on one side and flat on the other.

We pour in or shovel in the turnings, making the barrel not more than half full for best tumbling action. Then we put the screen door on our barrel. Run the barrel long enough to sift out the dust and shavings. This will also knock off burrs and smooth any rough edges.

If the surfaces are very rough they may be smoothed by first tumbling the work with an abrasive, such as shredded sandpaper or sandcloth or chunks of pumice. In this case the solid door would be used so as to avoid losing the abrasive. The work would then be screened to remove the abrasive. Then it might be well to tumble the turnings with several small rags for a few minutes to wipe off all traces of pumice. Most work comes from the millroom smooth enough to make such an operation entirely unnecessary.

Pour in Just Enough Lacquer

Second, the right amount of properly-thinned tumble base (red tumble lacquer) is poured over the work. After a little experimenting, the operator will know just how much is needed. Clamp the solid door in position and run the barrel long enough to distribute the finish evenly over all pieces.

If insufficient lacquer was poured in at first, more should be added before the work becomes thoroughly dry. Avoid pouring in too much lacquer, as it may pile up on the coated surfaces and cause roughness. On a preliminary trial, it will be necessary for the operator to inspect the work every few minutes to make sure that he is getting a satisfactory job.

One concern has a barrel 3-ft. in diameter by 5½-ft. in length. When half filled with small turnings, it holds about 10,000 pieces. This requires 10 quarts of red lacquer for a good finishing job. A conservative estimate is 300-sq.ft. of surface to a reduced gallon of tumble base. This will vary for harder or softer woods, the softer wood requiring more lacquer.

Third, remove the solid door and replace it with the screen door. Now run the barrel until this coating is dry and shows signs of becoming powdery. Do not run it too long, or the "high" rounded sides will begin to wear through and leave thin places in the finish. This is particularly true when balls or beads are being tumbled. Thirty minutes to one hour of tumbling should dry the finish.

The work now has an even coating of red lacquer. This finish is dry and dull—lacking in luster.

Adding Luster to the Coating; Methods of Polishing

To impart a luster to the colored surfaces, you have a choice of two general methods. One is to put lumps of paraffin wax—or better still, carnauba wax—in the barrel and rotate it until all surfaces are waxed. The waxed surfaces can be hardened and polished by additional rotating while the screen door is in place.

A harder surface and more brilliant luster are imparted by using, in place of wax, a liquid tumble polish. This liquid is colored with a small amount of the base coating (in the foregoing case, red).

With the solid door in place, pour a very small amount of polish over the work. Run the barrel just long enough to evenly distribute the polish. Four or five such applications will cover all the work.

Do not try to put all of the polish into the barrel at one time. It may soften the base coat and cause a mottled appearance. Too much polish might also cause the flat sides of the turnings to stick together. Even when the polish is properly added, the flat sides may have a tendency to stick together but, as the wax dries, they will break apart.

The barrel should not run too long between applications of polish. If the preceding application becomes too hard, the next application may soften it and give the turnings a streaked appearance. By carefully watching the first barrelful, the operator may avoid these conditions and know just how to finish succeeding work.

After all polish has been added and evenly distributed, the screen door may again be put in place to admit air to harden the finish; 15 minutes or so will accomplish this.

Time and Skill Involved

The entire operation, base coat and polishing, will usually require about two hours. The work is put into the barrel only once and remains there until it comes out dry and ready for packing or other operations.

With a little practice, an operator is able to operate several barrels—and herein lies part of the economy of tumbling. After a routine has been established, the operation is simple. This is not a job for just any green hand, however. The operator must study each job and know how to handle it.

The same turning with the same finish will require different treatment if a softer wood is used. A run of streaky grained wood will present its problem. Different colors vary in their hiding power and require varying amounts of thinner and varying quantities of lacquer for the work.

Most of the reputable manufacturers of tumble finishes will be glad to have one of their service men give preliminary training to a new operator. These men have a varied experience and can help to establish a routine that makes tumble finishing a simple operation.

Drying by Forced Draft

For very large barrels, it may be desirable to use a forced draft of air to dry and harden the work. Such a barrel has a hollow shaft at one end. Air, preferably warmed to 100° to 150°F., is forced through this shaft into the barrel. It may be exhausted through openings in the opposite end of the barrel or through a screen door in the side of the barrel. This draft is turned on only while the base coat

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or the polish is being hardened. It offers a means of speeding up this final drying.

Removing an Excess of Finish

If too much finishing material has been applied, through careless operation, or if a barrelful of work has been spoiled from some other cause, the finish may be removed by saturating rags in thinner and

placing them in with the turnings. Run the barrel until the surfaces are again smooth. It may be necessary to resaturate the rags from time to time. The turnings may be refinished in the regular way.

Finishing Odd Shapes

For pieces having deep crevices or holes drilled in them, it may be desirable to prevent lacquer from clogging these openings. First, apply a light coat of lacquer that has been lowered in viscosity by adding an extra amount of thinner. Then apply a coat of lacquer at its regular viscosity. This heavier lacquer will adhere to the first coat and it is not inclined to find its way into the openings. In this case, the first coat should not become too dry before the second coat is applied.

To Prevent Sticking

For work with flat sides—pieces that are inclined to stick together —I have already suggested that both the base coat and polish be added in small quantities. This prevents a heavy coating that may act somewhat like an adhesive.

It may also be desirable to add "tumble jacks" to the barrelful of work. These jacks are pieces of wood that roll around with the work and break it apart. If turnings made of soft wood are being finished, the jacks should also be made of soft wood so that they will not mar the finish. The jacks should not have sharp corners.

(To be continued)

How to Sell to the Government

A pamphlet designed to supply information concerning procedures employed by various Government agencies in making routine purchases of merchandise for civilian needs has been made available by the Department of Commerce for the information of businessmen who desire to sell Federal units.

It is not likely that the purchasing methods by the various agencies of the Government, as outlined in the booklet, will be radically changed by the impact of defense needs.

"There is no great mystery involved in doing business with the Government", according to the Department of Commerce. Any business man desiring to do such business may write to the Procurement Division, Treasury Department, Washington, D. C., and request to be listed to receive invitations to bid on items he can furnish, the Department reported.

Army and Navy Purchasing, it was announced, is explained by two booklets published by the respective Departments. The "Army Purchase Information Bulletin" (1940) may be had by writing the War Department, Washington, D. C. "Selling To The Navy" may be had upon application to the Navy Department, Washington, D. C.

The Department of Commerce booklet "How To Sell To The Government For Civilian Needs" may be had without charge upon application to the Department at Washington or any of its field offices centrally located throughout the United States.

Profits through Priorities

SEARCH FOR SUBSTITUTE FINISHES UNCOVERS IMPORTANT IMPROVEMENTS

BY I. R. MESSER

SHORTAGES in the field of industrial finishes may be blessings in disguise . . *Let me explain*: Many manufacturers have (for one reason or another) been using coatings that are neither completely efficient nor basically economical for *either* their product *or* their process.

Be Prepared to Meet a Shortage

In such cases, the forced, scientific search for a substitute will undoubtedly disclose opportunities for permanent improvements . . This is happening every day.

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If you have never had a good *prescription* paint laboratory analyze your coating problem, you may be in for a pleasant surprise. Specialists in this kind of work will "tailor make" a paint formula to fit your needs *exactly* . . and where a certain ingredient is no longer available they'll often find a substitute that out-performs the long accepted original.

It May Happen to You

The important point is to be *prepared*. Don't wait until a priority ruling pins you down. Submit details of your finishing requirements, at once, to a *true prescription* house like The Watson-Standard Company at Pittsburgh. This concern *guarantees* a manufacturer *answers* based on his individual conditions and not just the application of a standardized formula. Perhaps they'll find a way, at once, to give you better coatings at lower costs, but in any event, they can guide you through the difficult times ahead and you certainly are not putting yourself under any obligation.

Procrastination Is Dangerous

The Watson - Standard Company for years has specialized in prescription finishes for all surfaces by spray, dip, brush or roller application. Their field comprises every type of industry under every condition. Their record is impressive. To them, *the problem, not the prospect*, is the important *thing*. Write to them direct — today — with the assurance that your letter will receive the personal, confidential and sincere attention of some of the most highly skilled paint chemists in the country.—Advertisement.

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Lacquer and Synthetic

FINISHES FOR WOOD FURNITURE AND FIXTURES

BY F. R. BOYNTON

A few practical suggestions about fillers, sealers and primers, as used with lacquer and synthetic coatings over hardwood surfaces.

LACQUER FINISHES have done much to revolutionize former methods of finishing. Where available floor space for finishing is limited, where flying dust particles would damage a slow-drying finish, and where production must move rapidly — here lacquer has proved to be a real solution for difficult problems.

Lacquer has caused a lot of troubles in finishing rooms. For example, the order, "lacquer it this morning and ship this afternoon," has caused many finishing foremen plenty of trouble. A lacquer film, like any other coating has to have a certain amount of time to dry. The boss who is always pushing his finishers to the limit is surely inviting trouble—and rightly deserves it. Proper ventilation materially decreases the drying time of lacquers, as the fumes and foul air are carried off and thinners and solvents leave the film more readily.

Filler; Sealer Coat

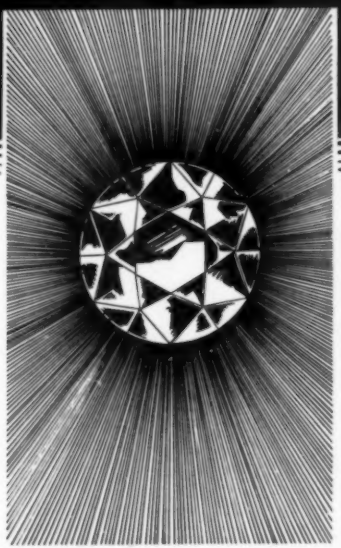
Filling has much to do with the performance of the lacquer coating. The tendency of the thinners and solvents to lift the filler and make a porous surface is often evident, and this, in turn, results in poor adhesion and brittleness of the lacquer film.

Sometimes the sealer coat, which is sprayed over the filler, softens the vehicle of the filler; the sealer absorbs most of it and this leaves the particles of inert pigments without support in the pores of the wood. When this occurs the quality of the sealer is materially reduced, giving poor support to the succeeding coats of lacquer.

A large manufacturer of finishing materials now has a filler on the market that greatly improves this condition. I have tested out this material and it is remarkable the way the lacquer adhesion is increased, even with the cheaper lacquers. This filler wipes clean and does not leave the cloudiness that is prevalent in so many other fillers. Force drying of fillers improves their resistance to the solvents incorporated in lacquer sealers. When using filler that is to be air-dried I suggest letting it dry two hours or more longer than the time specified by the manufacturer, if possible.

Lacquer Enamels

Lacquer enamels, such as those used in furniture finishing require as much attention as do the clear coatings. Primers that set up too fast and do not penetrate into the



BRILLIANCE

A Recognized Quality

IN

RELIANCE

FINISHES

TUF-TEX RUBBING VARNISH SPEDE-VAR
DURATONE STAINS SYNTHENOID ENAMELS
LO-VIS-LAC LACQUERS
VENEER-ITE AND BONNIE WOOD

RELIANCE VARNISH COMPANY
INCORPORATED
LOUISVILLE KENTUCKY U.S.A.

pores of the wood generally offer poor adhesion, and there is danger of chipping, peeling and scaling. It is always advisable to buy a good primer instead of a cheap one, for the performance obtained is worth more than the few cents extra it costs per gallon.

Plasticizers have an important part in the life of a lacquer film, either clear or pigmented. The lacquer is tempered with blown oils and phthalic resins to give it the desired elasticity. Film permeability governs the adhesion of surface coatings because it controls the interchange of moisture between the support and the atmosphere. If, due to impermeability, the film is not able to "breathe" properly, it will detach itself and peel off when vapors develop underneath.

New Varnish Developed

A new varnish has been developed that is very close to lacquer in performance. It has a varnish body, plus the quick-drying characteristics of lacquer. When or if it is necessary to really hurry, products can be completely coated, rubbed and shipped all in one day. For example, in a little test I tried with an article made of satinwood, a coat of sealer was sprayed on. After six hours of drying time the surfaces were oil-rubbed. The finish was perfectly smooth and level and it looked especially attractive.

I have experimented with this coating and have found it entirely satisfactory, producing a tough hard film after five or six hours of drying time. It has resistance to alcohol and can be obtained in either gloss or flat. The price is so small per gallon that it would materially reduce production costs in any finishing room where water-white coatings are not essential.

Fumed Oak Finish

SOME TIME ago I noticed a Q. & A. in regard to fumed oak finish. Twenty or 25 years ago I had charge of finishing thousands of pieces of furniture and never had a complaint about color. Here is the method I used to obtain the fumed oak finish: First, use a toner made up in the proportion of—

Tanic acid	(oz.) 1
Pyrogallic acid	(oz.) 1
Warm water	(gal.) 1

Sponge the oak surface with this and, when dry, sand smooth. Then make a stain of the following ingredients and in the proportion indicated—

Carbonate potash	(lbs.) 3
Bichromate potash	(oz.) 2
Walnut crystals	(oz.) 2
Amonia (28°)	(qts.) 3
Warm water	(gals.) 4½

Note: Keep this material in an earthenware crock, glass jar or wooden keg.

After staining, let the surface dry and apply one coat of white shellac. Sand lightly with fine sandpaper, and wax. Do not fill the surfaces, as this would spoil the effect.—G. L. Bartlett.

Paint Remover Book Free

An interesting book of facts about paint and varnish removers—and particularly the wax-free, non-inflammable I.C.D. Formula 9—has been published by the Industrial Chemical Development Corp., 331 Madison Ave., New York, N. Y.

The company calls attention to the great number of fatalities and injuries resulting from the use of dangerous and inflammable cleansing materials.

Most of the booklet's contents are in Question-Answer style, for example:

Q: You state that the material shows no "flash". What advantage is this?

A: It allows the use of this product in engine rooms, on electrical equipment where an arc might be drawn, without danger. It also eliminates the possibility of fire where steelwool or a wire brush is used for removing material on a metal surface which might cause a spark.

INDUSTRIAL FINISHES

to Enhance the Appearance

OF EVERY SURFACE

Specially Made for All Processes

Including **ROLLER COAT • GASKET DIP**

TUMBLE • SCREEN PROCESS

JAMES B. DAY & CO.

CHICAGO

Finishes Metal and Plastic Alike

The Duralac Chemical Corp., 90 Lister Ave., Newark, N. J., announces development of a line of Sea-Lac Plastic-Seal baking enamels that can be used alike on both plastic and metal parts of a particular product. The result is a harmonious blending of plastic and metal in the finished product.

For one specific application involving hard-to-match colors the company's laboratory developed one material for the plastic part and another for the metal part. They both baked out to match exactly as to color. Each was a one-coat job. Where priority difficulties indicate the advisability of replacing metals with plastics the company is prepared to recommend materials and finishing schedules for the solution of any problems involved.

Heavy Portable Spray Outfits

Two greatly improved series of 4-hp. and 6-hp. portable spray-painting air-compressing outfits, for operation of two and three spray guns, have just been released by the DeVilbiss Co.

The outfits are ideal for larger installations, for example, for industrial and maintenance work, highway departments, public works, oil fields, mines, public buildings and the like.

Twenty assemblies are included in the two series—skid-mounted outfits, rubber-tired and steel-wheel trucks, and 2-wheel trailers.

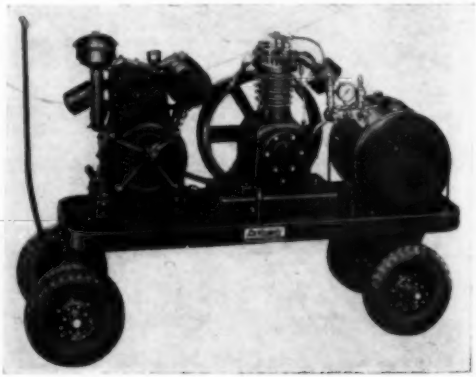
The 6-hp. units may be had with or without an electric starter. Air-cooled or water-cooled engines are optional with this series. All 6-hp. units have twin disc clutch as standard equipment. This permits starting of the engine independently of the compressor.

Spray-painting equipment for use with the outfits has been set up to be purchased separately from the air-compressing outfits. Two-gun equipment is designated as type QM-6016. It may be used with any of the 4-hp. or 6-hp. compressing outfits. Three-gun equipment, for use with the 6-hp. units, is designated as type QM-6017.

Complete information regarding the

New . . .

MATERIALS
SUPPLIES
EQUIPMENT



The new DeVilbiss 4-hp. gasoline-engine-driven, portable, air-compressing outfit for operation of 2-gun spray-painting equipment. This assembly is also available with 2-wheel trailer mounting.

STANLEY HAS *most* OF THE ANSWERS

If your head's in a whirl with a finishing problem . . . call STANLEY, and r-e-l-a-x. The thousand-and-one considerations in selecting the EXACTLY RIGHT finish for YOUR product are grist-to-the-mill for us . . . . . everyday problems to which STANLEY Chemists already have MOST of the answers. Our research files may contain RIGHT NOW the formula which will cut your finishing time, reduce your finishing costs, improve the appearance of your product, and INCREASE YOUR PROFITS! Your inquiry incurs no obligation. Address Department "I".

THE STANLEY CHEMICAL CO.

EAST BERLIN CONNECTICUT

Lacquers · Enamels · Synthetics · Japans

A SUBSIDIARY OF THE STANLEY WORKS NEW BRITAIN CONN.

new DeVilbiss TS and TD (4-hp.) and TNS and TN (6-hp.) spray-painting air-compressing outfits may be had from DeVilbiss jobbers, or direct from the DeVilbiss Co., 300 Phillips Ave., Toledo, Ohio.

Sandpaper Disc Cement

A pressure-sensative cement for use on the paper back of abrasive paper to make it stick to a sanding block, faceplate of a disc sander, or around a drum or spindle, is announced by Fanwood Specialties Co., Plainfield, N. J. It is called "T-31".

Quoting from the company's folder:

"T-31 requires no mixing or heating before use. You merely spread it on the back of sandpaper disc only. Apply one thin coat evenly and allow it to dry 15 minutes. Then press the sandpaper disc firmly to the faceplate. It may be used immediately. It is not necessary to put cement on the faceplate.

"To remove disc, merely peel it off and store it in a dust-free atmosphere. It may be used again by pressing it against the faceplate. Do not add another coat of cement. This cement will adhere to paper, metal, wood, rubber or felt. It is a pressure-sensitive cement—the harder the work, the tighter it sticks. When the disc is not in use, moisture in the air may cause the sandpaper to curl away from the faceplate. If it does this, just press it into place and it will adhere firmly again."

Immersion Type Heaters

H. O. Swoboda, Inc., 141 Thirteenth St., New Brighton, Pa., announces production of a new line of Falcon electric immersion-type booster heaters for maintaining and increasing temperatures of a wide range of materials. These heaters are available in capacities ranging from 10-kw. to as much as 1000-kw. output. In many coating and saturating processes involving the use of heated asphalts, oils, paraffins, waxes, resins, creosote, varnishes, insulating varnishes, etc., it is necessary to increase or maintain temperature of the material by applying heat in the line between storage tank and the container where processing occurs.

Consisting of spirally-coiled heater strips arranged to form a compact unit, the heater is installed in a sealed tank built in the pipe line between storage vessel and coating or saturating tank. Temperature is maintained uniformly by means of automatic controls, either thermostat or pyrometer with thermocouple. Only two simple connections are necessary for connecting the heater to the electric circuit.

Metal Cleaning Progress

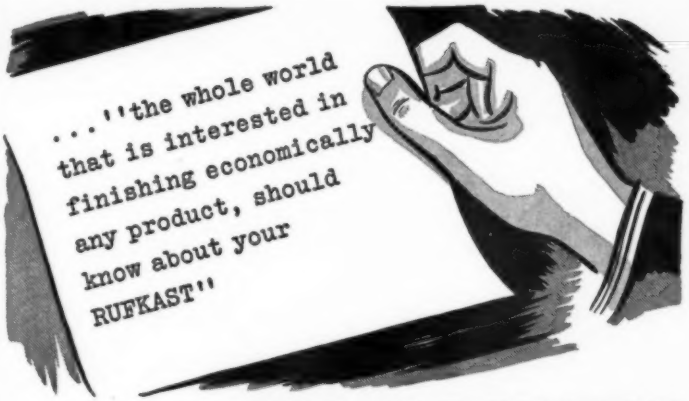
A letter to the Editor from Oakite Products, Inc., 22 Thames St., New York, N. Y., follows:

Calling for "all-out" production in metal fabrications of all sizes, shapes and kinds, the National Defense Program is focusing more and more attention on the increasing functions and facilities of metallurgical research.

Since production cleaning and related metal manufacturing operations are highly important in this respect, we believe you will be interested in learning that the Metals Section of the Oakite Research Laboratories has been expanded to the point where it provides what we think are the most modern facilities available for reproducing, on a pilot-plant scale, actual production conditions generally found in metal plating and fabricating plants.

With the expansion of this metal plating Laboratory and the installation of the latest equipment available . . . buffing machines, the spray-type metal washing machine, welded-steel cleaning solution tanks, running-water tank and shower sprays for rinsing, rectifiers and a number of plating tanks . . . it is possible to control composition of the cleaning solution, current density, timing of cycles, soil loading and other variables encountered in metal plating and finishing practice.

As a result, this development, together with our nation-wide staff of



THAT'S THE WAY WE FEEL ABOUT IT, TOO!

These words, in reference to Berry Brothers RUFKAST Finishes, quoted from a letter from Mr. R. L. Schuhmann, President of the American Duplex Co., Louisville, Ky., makers of Coffee Mills, tell the story completely. And they certainly carry maximum weight when they come from a user.

Mr. Schuhmann also says in his letter, "Berry Brothers RUFKAST is 100% air-dry, and its adhesion is remarkable."

Berry Brothers RUFKAST has a fine, uniform pattern which minimizes any surface irregularities, and at the same time provides an attractive decorative finish which adds to the eye-appeal. Cost is low, and ample raw material sources assure uninterrupted production schedules.

Write for sample panel — or let us finish one of your products in our laboratory.

Quality Finishes Since 1858

BERRY BROTHERS

Industrial Varnishes • Enamels • Lacquers

DETROIT, MICHIGAN • WALKERVILLE, ONTARIO

JERSEY CITY • BOSTON • CINCINNATI • CHICAGO • ST. LOUIS

service representatives, enables our company to provide plants working on defense or other orders with greater technical service and closer cooperation on any production problem they may have relating to the preparation of metals for electroplating or other finishing operations.

"Lacstix" for Burn-in Repairs

Finishine Laboratories, Inc., 319 Clinton St., Syracuse, N. Y., has produced a new type of "Burn-In-Stix" called "Lacstix." Repairs made with this material do not lift lacquer or synthetic finishes. Lacstix is composed of a peculiar combination of gums and other ingredients which prevent it from lifting or bulging under lacquer or synthetic.

Samples are available upon request together with a free instruction catalog card "Book on Finishing" showing actual sample buttons for testing.

Flocking Base; Flocking Ink

The Naz-Dar Co., 477 Milwaukee Ave., Chicago, Ill., announces two new products, as indicated in the above title. The No. 907 Flocking Base is designed, "for exceptional results when adhering flock to any surface, especially fabrics". It is a neutral colored base that can be used straight from the can or mixed in proportions up to 50% with Naz-Dar weather-proof enamel when color is desired.

No. 907 Base is also recommended for adding to weather-proof enamel or poster colors when printing on felt, canvas, duck or any other fabric where maximum coverage is desired. The special properties of this base cause the color to set on top of the material, thus assuring good hiding power.

The Special Flocking Ink is for letterpress printing. It is used with letterpress or cylinder press in exactly the same way as regular printing ink. Due to its special qualities it gives perfect adhesion to flock, which so far has not been possible with ordinary printing ink.

According to the company, "greeting card manufacturers and novelty printers will find this special Naz-Dar ink to be just the thing they have been looking for."

How to Get Refinishing Jobs

In the past, many industries have developed new markets to take care of slack seasons. These new developments have many times proved to carry an industry over this period, stabilizing employment and building a stronger business.

A plan to develop new markets for Auto Repaint Shops is being worked out by far-sighted shop owners. During slack seasons, neighborhoods are canvassed for repaint jobs on household equipment. Many times housewives wish to have refrigerators, washing machines, electric food mixers, and lawn furniture repainted to match color schemes, cover up scratches and damaged spots. In this way many appliances that are in good mechanical condition get a new lease on life.

The Minnesota Mining & Mfg. Co., of Saint Paul, Minn., have offered a new thought on ways to secure additional business for Auto Repaint and Repair Shops and have put this information in folder form. In addition, on the back page of this folder are directions for repairing and refinishing refrigerators, washing machines, etc., as outlined by the company.

In order to help Auto Repaint Shops promote this new market, a "business getting" card is offered, giving details of the plan and has been made available for Auto Repaint Shops to send to homes in their vicinity. These cards will be furnished shops in reasonable quantities, with shop name and address imprinted, at no cost, by writing the Advertising Department of Minnesota Mining & Mfg. Co., Saint Paul, Minn.

Naz-Dar Company Moves to Larger Quarters

An announcement from the Naz-Dar Co., manufacturers of silk-screen process colors, equipment and supplies, Chicago, Ill., states that the concern has moved to a larger and completely modern factory, centrally located at 469-483 Milwaukee Ave. When you write them please remember the address.

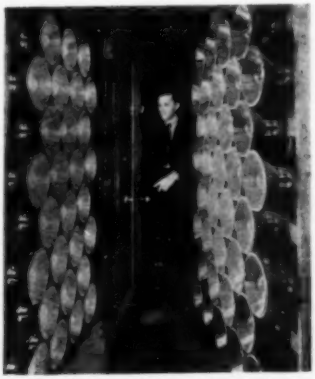
BANISH BOTTLENECKS due to DRYING DELAYS!

with WESTINGHOUSE RADIANT HEAT DRYING LAMPS

● STARTS AT THE FLIP OF A SWITCH

Radiant Heat being of the same general nature as visible light, is as easily controlled. A flip of the switch and the heat is there in full force. No delay. No elaborate insulated ovens or time-consuming pre-heating. See your local Westinghouse Mazda Lamp distributor or write for folder, Westinghouse Lamp Division, Bloomfield, New Jersey.

Westinghouse Drying Lamps are also being used to dry paints, lacquers, and enamels faster and better.



Synthetic enamel dries in 12 minutes under these drying lamps mounted on two portable racks.

● FASTER! . . CHEAPER! . . EASIER!

No wonder business everywhere is turning to this new, economical way of heating and drying! Radiant heat *penetrates* the surface finish or film, causing more rapid drying of lacquers, paints and enamels. Greater speed plus lower installation and maintenance costs have resulted in lower total processing costs, fewer "bottlenecks" due to drying delays.

Westinghouse

RADIANT HEAT DRYING LAMPS

Electric Drying of Finish

Some time ago we lost all of our back numbers of INDUSTRIAL FINISHING as a result of enemy action.

You will recall that in an old issue there was an article dealing with the method of drying finishes on metal objects by passing a high-frequency current through the articles, the idea being that this obtained drying from underneath instead of surface drying.

We would be extremely obliged if you could let us have a copy of this particular back number and also if you could furnish details of any developments to this process which have since been effected.

Many people over here are taking an interest in infra-red stoving [baking] but it occurs to us that the high-frequency baking may have certain advantages.

We regret having to trouble you but can assure you that the loss of this valuable information was not the least of our misfortunes.—P. M. B., Ltd., ENGLAND.

We do not recall of having published an article about high-frequency electric drying, such as you describe. It occurs to us that this would be impractical, or very limited in its possibilities.

Could it be possible that you have in mind the use of a high-voltage electric field for the removal of paint beads from dipped work, as described and illustrated in a feature article in Dec. 1940 issue, and also briefly described in Feb. 1941 issue, page 64? Or perhaps you have read about the idea elsewhere.

We have electric ovens and infra-red electric drying but, of course, that isn't what you have in mind. For further information on infra-red drying, we are sending you tear sheets of articles published in recent issues of INDUSTRIAL FINISHING.—ED.

Editor's Note: Does any reader know anything about drying surface coatings on metal by passing an electric current through the articles?

Questions; Answers

Questions are welcome and will be answered promptly by mail. Readers are invited to prepare and send in additional information relating to any of these questions and answers.

Sweating Pipes

We would appreciate it if you would kindly advise whether or not you know of a paint that can be applied to pipes to eliminate excessive moisture, or sweating on the outside.—H. C. Co. (Furn.).

This question is well answered by an article under the title, "Prevents Condensation Drips," as publsihed on page 64 of June 1941 issue of INDUSTRIAL FINISHING Magazine. Quoting from the article:

"A coating of 'Insulmat' will prevent condensation from forming on cold surfaces during summer days when the atmosphere is heavily loaded with moisture. We all know how the dripping from cold pipes, ceilings or other surfaces can prove harmful to products stored or in process of manufacture. . . .

"This material is a spray-on

Infra-Red Finishing News

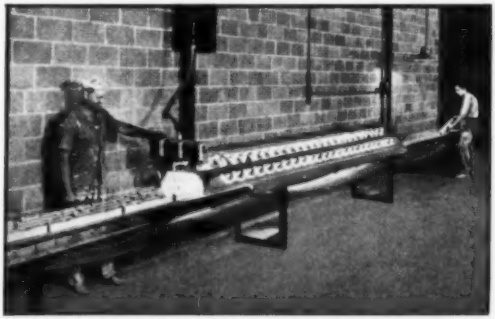
PUBLISHERS—AULT & WIBORG CORPORATION, NEW YORK CITY, SEPTEMBER, 1941

PRODUCTION SPEEDED WITH A & W INFRA-RED FORMULAS, SAY LEADING MANUFACTURERS

Much Faster Schedules, Finer Finish Attained In Many Installations

In times like these, how to speed up production and increase plant capacities concerns many manufacturers. Leading users of fast infra-red baking methods say that A & W infra-red formulas help to cut finishing time and quicken production schedules.

Ault & Wiborg pioneered in the development of infra-red finishes—finishes that make it possible to take full advantage of the speedier schedules which infra-red setups permit. A & W formulas are being used to finish a great variety of products, large and small, by infra-red methods. Included in this list of products are storage files, washing machines, steel building sections, water heaters, vacuum jugs, auto heaters, cash registers, automobile moldings, vacuum cleaners, casket hardware, and Venetian blind strips.



At the Mintz Co., in Cleveland, a new metal headrail for Venetian blinds is baked on a three and a half minute schedule in a 14 foot infra-red lamp setup. Here, too, A & W infra-red formulas are used. Temperature attained on 24 gauge metal is 400 degrees F., and an average of 250 finished headrails is turned out per hour. The finish which results is durable and uniform.

Here is the new, enlarged infra-red lamp setup at the Dickey-Crabler Co., Cleveland. Fast-baking A & W finishes are used on casket hardware to produce a resistant, uniform, attractive surface. Switching from lacquer, Dickey-Crabler speeded their baking cycle to only six and a half minutes; they save money on material costs and yet achieve a tougher finish.

Ask leading users about A & W finishes! They will tell you to use fast-baking A & W materials for a harder, tougher, more uniform finish. On this page are shown two of the many Ault & Wiborg infra-red installations. If you are considering the use of infra-red, write for more information on how A & W finishes can speed your production!

This Free Booklet Tells What Infra-Red Can Do

Since finishing operations with infra-red lamps are still relatively new to most manufacturers, there may be many questions concerning infra-red applications which you want answered. A new booklet, "The Facts About Infra-Red" contains questions most commonly asked about infra-red, and the answers to them.

We should be glad to send you a free copy of "The Facts About Infra-Red" Drop a line to Dept. IFS, Ault & Wiborg Corporation, 75 Varick St., New York City. Why not write today?

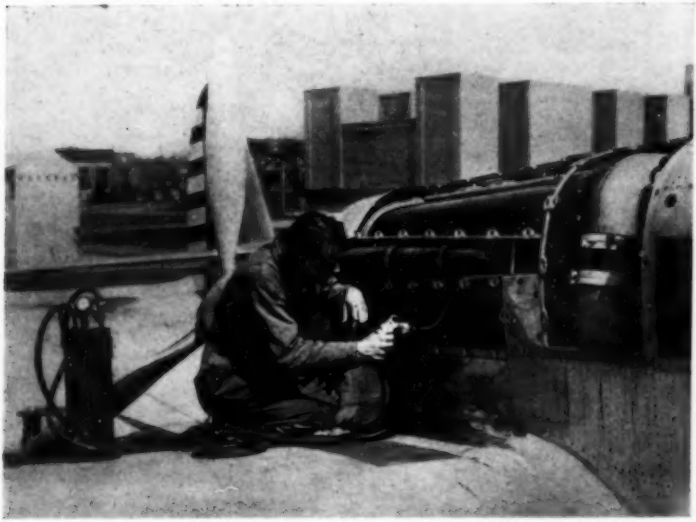
plastic compound containing specially treated cork particles, guaranteed to absolutely eliminate condensation drip. It is self-bonding, requires no priming coat, adhesive or supports, and can be applied to any metal surface. There is no upkeep and it is said to last as long as the metal to which it is applied.

"At Purdue University, 'Insulmat' No. 595 has been subjected to intensive vibration and other severe tests under various conditions and has been found to possess unusual adhesion, to be odorless, and to form a valuable protective coating to metals."

As we have said many times before, so we repeat again: Read every copy of INDUSTRIAL FINISHING carefully and then file all copies in some safe place for frequent future reference.—ED.

Limed Oak Finish

We have received an inquiry to the possibility of our supplying materials which are required for producing a limed oak finish. We



Uses to which spray-painting equipment is being put in the national defense field are many and varied. For example, at military airfields throughout the United States, every fighter 'plane and bomber which has been out of active service as long as a week has its engine sprayed with an anti-corrosive compound containing castor oil. The above illustration shows this work being done on a fighter based at Wright Field, Dayton, Ohio. Other ways in which spray-painting equipment is used to prepare our military sky fighters for their jobs include the spraying of protective and decorative coatings, both inside and outside the 'planes, the spraying of non-reflecting paint on nacelles and propellers to prevent glare, and the application of sound deadeners inside fuselages to kill motor vibration. Photograph, Courtesy of The DeVilbiss Co.

"A Star Is Born"

SPEEDROY **RW-316** SPEEDROY

WATER WHITE LACQUER

with

27% Solids at the Gun!

A Royalty Water White Lacquer that meets the most exacting specifications and requirements.

A free generous working sample will convince you of its superiority. Write today.

RUDLACO

RUDD LACQUER CORPORATION
127 MAIDEN LANE, NEW YORK
Factory—Rahway, N. J.

FLOCK IT!

Have you an item that can be improved in appearance or utility by decoration? Then give it a coating of beautiful lustrous Rayon.

FLOCK IT!

by spray gun or screen process. Watch your sales and profits rise from the added beauty or utility of your product. It's happening to hundreds of firms who have adopted a flock finish. Examine your line for a product that can benefit by this finish and

FLOCK IT!

Write for color card and samples.

CLAREMONT WASTE MFG. CO.

CLAREMONT, N. H.

The country's leading manufacturers

are not familiar with this finish, and we are wondering whether or not you can give us any data on how this finish is produced. We shall appreciate any information that you can give us on the subject.—X. Y. Co.

The limed oak finish we have in mind is a sort of blond oak streaked with either white or light gray. It is produced in a number of different tints—and by different methods.

One of the lower cost methods is to first select the wood for reasonably uniform light color. Apply a clear lacquer sealer coat. Then apply white, off-white or light gray filler suitable for use between lacquer coats. After this has been properly rubbed into the pores of the wood and the excess has been wiped off clean—and when what is left has become thoroughly dry—apply one or two or three coats of clear or mildly tinted lacquer. The lacquer can be tinted white or pale rose or light gray or off-yellow, as desired. Rub to kill the gloss, and, if desirable or allowable, apply wax.

Naturally, this process is capable of variation. For example, oak can be bleached all over or only at the dark areas before sealer coat or filler is applied. Or, the lacquer used may be what is generally called bleaching lacquer.—ED.

Radio Cabinet Finish

THE PROCESS of finishing a radio cabinet, to get the proper results, is along the same lines that any cabinet finishing is done. Usually, on some middle-class radio cabinets, the job is started by using a combination stain and filler for a base color. This is followed by a coat of sealer, after

You can always Depend on MILBURN

FINISHING, WELDING and CUTTING EQUIPMENT

TYPE OM SPRAY GUN—Light in weight, compact. Operates as production unit for continuous service or for touch-up work. Features "Hollow Air" atomizing principle. Top efficiency with all types of spray material.

MILBURN CUTTING AND WELDING TORCHES—Sturdily constructed to highest government standards. Illustrated is the Type HMS—a modern development in the welding art. With attachments it can be used for welding, brazing, soldering and cutting.

MILBURN CUTTING AND WELDING TIPS—Made of special rolled copper and embody outstanding features to give high efficiency, longer life and lower consumption of gas. Interchangeable.

Write for complete catalog of paint spray equipment, welding and cutting apparatus and regulators.

The ALEXANDER MILBURN Company

1402 West Baltimore Street — — Baltimore, Maryland

LIGHT AND COMFORTABLE
PROTECTION
AGAINST HARMFUL
PAINT
SPRAY
VAPORS

THE M-S-A Comfo
CHEMICAL CARTRIDGE
RESPIRATOR

Provides easy-to-wear comfort and safety against vapors of paints, lacquers and enamels encountered in spraying; such as turpentine, petroleum distillates, acetates, coal tar derivatives, alcohols, etc. Cartridges quickly replaceable. Bulletin EM-3.

MINE SAFETY APPLIANCES CO.
BRADDOCK, THOMAS and MEADE STS., PITTSBURGH, PA.
District Representatives in Principal Cities

MARTIN'S

PRODUCTION PROVEN

INDUSTRIAL FINISHES

Finishing system scientifically developed to meet your specific conditions will (1) Cut finishing cost per unit (2) Save time by reducing the number of finishing operations.

MARTIN VARNISH CO.
900 WEST 49TH PLACE
CHICAGO, ILL.

which the surface is sanded. Then, to produce a 2-tone color combination, the cabinet is masked by applying masking tape to the parts that are not to be colored. After this operation has been completed, the tape is removed.

The cabinet is cleaned up and touched up—burning-in all bruised parts—to make it ready for the finish coats of a high-gloss lacquer. One coat usually does the job on the cheaper class of work, while two coats are needed for the better jobs.

On this class of work rubbing is cut short by using a wet-or-dry sand paper, along with a combination of naphtha, rubbing oil and rubbing compound, mixed in the right proportions. This will give a real surfaced job of rubbing.

After getting the finish rubbed in this way to a smooth uniform surface, a high polish can be produced by using a rubbing compound and rubbing with the grain to take out all scratches. Then use a cleaner to remove all substances from the surfaces. Wax and polish the surface to complete the job. This method should give excellent results.—F. W. WORTH.

Ways to Cut Costs in the Finishing Room

A FINISHER can usually reduce the expenses in his department considerably if he will only adopt the following attitude: *What if I were paying for all of this material myself?*

Most finishers handle an enormous quantity of material in a year's time, amounting in cost to several thousand dollars worth. Accustomed to thinking in terms of drums, the average finisher is likely to overlook the loss of a few

Always At Your Service

The abnormal condition of the raw material markets makes it important—now more than ever — to work closely with your source of supply for your finishes.

Hilo is alert in obtaining its allotment of all available raw materials and is constantly exploring the new fields and applying new techniques to continue to fill the daily needs of our old friends.

With some items the raw material situation is not yet acute and Hilo can expand its service on them.

If you are not now using them try Hilo Black Japans and Enamels. They are the old standbys of the Industrial Finisher and are your best bet for CONTINUAL AVAILABILITY because of their formulation. Send your trial order today.

HILO VARNISH CORP.

51 STEWART AVENUE, BROOKLYN, N. Y.

CHICAGO, ILLINOIS BOSTON, MASSACHUSETTS

Kindly mention INDUSTRIAL FINISHING when writing advertisers

I. C. D. FORMULA NINE

« wax free REMOVER »

for paint, varnish, lacquer, baked enamel, cement, etc.

NON-INFLAMMABLE—EASY TO APPLY . . . NO AFTER-CLEANING

I-C-D FORMULA 9 is safe, non-inflammable and wax free . . . can be brushed or sprayed . . . Quickly removes all kinds of finishes and coatings . . . Doesn't raise grain nor discolor . . . It costs less to use . . . saves time, labor and material.

SPECIALTY COATINGS—I-C-D laboratories have specialized in formulating and manufacturing non-inflammable coatings and substitute finishes. If you have a tough coating or finishing problem send in your specifications, finishing schedule and requirements. Quick action, quick results if possible and a quick answer is promised.

INDUSTRIAL CHEMICAL DEVELOPMENT CORP.
111 MADISON AVE. NEW YORK, N. Y.

SYNTHETIC USERS

Everywhere we find users of synthetics turning to lacquers and lacquer enamels, because of the scarcity of the raw materials needed to make synthetics.

For years we have been making synthetics, lacquers and lacquer enamels and are qualified to make recommendations which fit perfectly into your present finishing schedules. Samples and full information will be sent to you gladly at your request. Write or wire today.

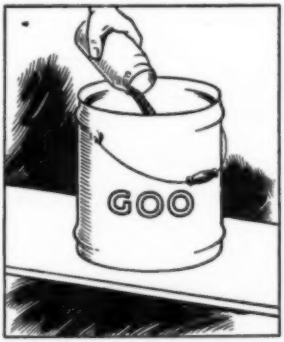
SEA-LAC
REG. U.S. PAT. OFF.

DURALAC CHEMICAL CORPORATION

90 LISTER AVENUE **NEWARK, N. J.**

pints here and there, whether it be from faulty handling or poor methods of application. However, these "heres and theres" will, in a short time, amount to his week's salary. If he were shelling out a couple of bucks for each gallon lost it would be a different story.

Small quantities of left-over paint can be mixed together and used on surfaces where color is not important. In this plant, for example, we have occasion to paint the inside of our product, which



This bucket pays a $410 dividend.

requires only a small amount for each unit. We use the left-overs out of the "goo bucket," as it is called, and it saves a corresponding amount of grey primer which was formerly used. For thinning this mixture we use the thinner in which our stencils have been washed. This contains some lacquer itself.

Now let's take our pencil and figure it up, say for a week's time:

Lacquer per day, 2 quarts, for 5 days, 2½ gallons @ $2.00 per gallon	$5.00
Reducer per day, 2 quarts, for 5 days, 2½ gallons, @ 80 cents per gallon	$3.00
Total per week	$8.00

RANDOLPH
Low-Inflammable
DOPE

REDUCES combustibility of a fabric surface by 100% or More! Available in Clear; Full Range of Colors and in Hot Dope form on special order.

Send for sample and detailed information.

Dopes—Thinners
Lacquers—Synthetics

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FINISHING PRODUCTS CO.
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Assures Better and Faster
FINISH BAKING

The proper finish baking oven will improve results, eliminate rejects, speed up production and cut costs. See Despatch for proper recommendations and the proper oven for better and faster finish baking.

FOR DEFENSE

A DESPATCH OVEN BAKING FINISH ON MOTORS

WRITE FOR DETAILS
DESPATCH OVEN COMPANY
MINNEAPOLIS, MINNESOTA

NEW! . . . . *Pulmosan*
M3C CHEMICAL RESPIRATOR

50% EASIER BREATHING
●
LIGHTER WEIGHT
●
HIGH SAFETY
●
LOW COST

Spray men will like the comfort of the M3C Respirator—you will like its low price. Aluminum body, patented rubber cushion, exhalation valve, other valuable features. Get details.

PULMOSAN SAFETY EQUIP. CORPORATION
Dept. IF, 176 Johnson St., Brooklyn, New York

NATIONAL PAINT DICTIONARY

1940 — $5.00

More than a Dictionary—an Encyclopedia. This is the most complete work of its kind now available. It includes definitions of trade names of raw materials used in the Paint and Allied industries—also charts, tables, useful information and miscellaneous data to which you can refer often. It describes all the important testing devices and apparatus used in the laboratory, together with illustrations and is strictly technical, thoroughly authentic and completely unbiased.

INDUSTRIAL FINISHING
222 East Ohio St. Indianapolis, Ind.

In a year this would amount to $410, which is not a bad saving.

Sometimes there is a waste product in another part of the plant that can be utilized in the finishing room. For instance, the tow binding that is wrapped around upholstering cotton is excellent for wiping filler.

Sandpaper is an article that is wastefully handled, especially if sanding is done by hand. In our shop it is the rule to wad up a piece of sandpaper before it is discarded; then when we pick up a piece that is still folded properly for using we know it is not worn out.

Thinner is also squandered in many shops, probably because it is so plentiful. Some men have the idea that they should open the faucet and wash their hands in it like they use water at the kitchen sink. If solvents are used for washing and cleaning, the cheapest grade should be used. For cleaning the hands, a few ounces on a rag will do as well as a gallon.—AL MATLOCK.

Frolics in the Finishing Room—5

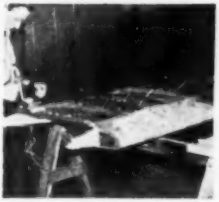
A NUMBER of years ago, in a factory where I worked, there was a man whom I'll call Fred Fox, who was always dissatisfied about everything. He would quit his job at our place and go out on another job; then he would come back, etc.

One day the boys got the office manager to type a letter to Fred saying that he had been well recommended and that the manager would be at the local hotel on a certain day at 11 o'clock in the morning for an interview. That day Fred came in all dressed up and declared:

FOR YOUR DEFENSE
AGAINST WASTE OF TIME, LABOR AND MATERIALS—USE THE Easy
RECIPROCATING ELECTRIC SANDER

Above: Sanding plywood wings and stabilizers.

Below: Sanding "Alclad" before welding.



Don't let slow, expensive hand finishing and the scarcity of skilled labor tie up production. Whether or not it's a defense contract, it's speed you want—and it's speed you get with the Easy Electric Sander. One inexperienced man, with the Easy, can do the work three times faster and cut time, labor and abrasive costs up to 80%. That's why industry's leaders are using the EASY for every finishing application on metal, wood, plastic, composition and other surfaces.

Save Dollars the "Easy" Way—Write for Literature Today.

DETROIT SURFACING MACHINE COMPANY
7434 West Davison Detroit, Michigan

"Well I am about ready to get out of this place."

About 10:30 he rang out and went to the hotel. It so happened that there had been a man at the hotel the day before by the same name we had given in the letter.

After lunch Fred returned very much down in the dumps. He thought he had missed out on a good chance for a better job. He talked about it for a week. Finally it leaked out that it was a frame-up. When Fred heard this he was hotter than a ball of fire. He had been fooled and he had lost two hours of working time. He was then ready to take on everyone in the shop.—J. K. COOPER.

Infra-Red Baking Solves Production Problem

(Continued from page 25)

Mr. Meyer quickly recognized the advantages of his new equipment. It provided a means of stepping up production schedules and aided in producing a superior finish. Also, no more spoiled lamps showed up. Whether the infra-red radiation, through its penetrating power, completely absorbs the hid-

NOW Ready to Ship This New Casco No. 602 Healthguard Abrasive Mask and Casco Paint Spray Mask!

NEW comfort and improved construction features that will help you maintain production at high efficiency and reduce industrial hazards. Faster, better protection for sandblast and paint spray operations.

New Casco No. 602 ABRASIVE MASK (above) works with high or low pressure air. Highly efficient in silica, metallic and mixed dusts. New approval No. 1918, U. S. Bureau of Mines.

Casco PAINT SPRAY MASK

Made in light muslin, rubberized cloth, or heavy khaki. Hood, attached to cap, fits snugly, protects shoulders. Big plastacele window for wide-range of vision. Fitted with tube for compressed air if desired.

Get Circulars—Prices—Full Details—Write

CHICAGO EYE SHIELD CO.

2367 Warren Blvd. Chicago, Ill.

den cyanide or somehow acts to nullify its corrosive power, has not been determined. Of greater concern to him is the fact that discoloration of his metal lamp bases and shafts has ceased. This he attributes entirely to the infra-red lamps.

Sherwin-Williams to Operate Ordnance Plant

Plans have been completed by The Sherwin-Williams Co. of Cleveland, Ohio, for construction, management and operation for the government of a huge bomb and shell-loading plant known as Illinois Ordnance Works, to be built on Crab Orchard Lake at Marion, Ill.

A separate company, known as The Sherwin-Williams Defense Corp., has been set up to operate the new project on a management contract, with headquarters at Cleveland, Ohio.

In charge of the new ordnance plant's operation will be E. E. Ware, Vice President of The Sherwin-Williams Co. In addition to many years of chemical engineering and operating experience in the paint industry, Mr. Ware was active in the World War Muscle Shoals development, where he served as a Lieutenant Colonel. For the past two years, Colonel Ware has been in charge of developing and operating the new Sherwin-Williams Titanium Plant at Gloucester, N. J.

The new plant site in Southern Illinois comprises some 25,000 acres of land. Exclusive of the cost of the land, the estimated construction cost of the works including equipment is between $27,000,000 and $40,000,000. The construction and operation of the plant will require several thousand men, most of whom are expected to be drawn from the immediate vicinity of the plant site.

While the ammunition-loading operation will be new to The Sherwin-Williams Co. and different from paint and varnish manufacture, nevertheless, the company has acquired experience and trained personnel through the operation of its 22 factories, which include chemical, dye, dry color and insecticide plants.

DeVilbiss Plant Expanded

Increased demand for spray painting and exhaust equipment of both standard and special designs throughout the defense industries has occasioned another substantial plant expansion at the DeVilbiss Co., in Toledo, Ohio.

The addition, which will double the size of the company's spray booth and exhaust equipment division, is the second expansion program to be carried out by DeVilbiss in recent months. The size of its air compressor division was recently increased substantially.

The DeVilbiss Co. currently is turning out spray-painting and allied equipment for a wide variety of uses in defense industry as well as in Army and Navy operations throughout the months, and these are now in use by shell-coating machines for several country.

The company has been making a large number of shell manufacturers in the United States.

With respect particularly to the spray booth and exhaust equipment division, however, it not only is touching new fields of Army and Navy efforts, but is reaching into the machine-tool industry where speed and an abandonment of old hand-spraying methods has made mechanized performance a virtual necessity.

MODERN PRODUCTS

MODERN PRODUCTION FINISHES

PRIMERS
SURFACERS
SYNTHETICS
LACQUERS
WRINKLES

To Speed Your Defense Production Requirements

"Call on Walker"

H. V. WALKER CO.
Elizabeth, New Jersey

Industrial FINISHING

Distributed monthly to finishing room and paint shop foremen, production superintendents and company officials of metalworking, woodworking and miscellaneous industrial plants where production finishing is a major operation in parts and products manufacture.

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Editorial

Prices of Materials and Their Availability

Users of finishing materials are faced with new and extraordinary problems. Not only is the price trend of materials upward, but some materials are difficult if not impossible to get for the time being. Substitutions are being sought, found developed and improved as the demands and prices for various materials increase.

Price increases usually mean bad news to the buyer, and most manufacturers of finishing materials are reluctant to announce price increases to customers unless and until this is absolutely necessary. It has now become necessary with most materials. One manufacturer states the case clearly and sensibly in a bulletin of new prices issued under date of September 2, 1941. To its customers, this company says:

"We regret very much the price increases on our products that are made effective with this list. It is due to conditions beyond our control. For over a year the prices on many of the raw materials which we use in the manufacture of our products have been advancing steadily, and within the past few months nearly all products have increased in price. The trend is still upward. In addition, raw materials are becoming scarce and hard to secure at any price, due to the existing defense situation. We could, of course, maintain the same prices by lowering the quality of our products, but rather than endanger our reputation for high-grade merchandise, that we have built up over a period of 20 years, we prefer to increase the price in order to take care of the added cost of manufacturing.

"We feel that this will meet with the approval of our thousands of friends and customers throughout the country and you may rest assured that prices will be lowered again as soon as possible.

"It must be understood that the prices quoted in this supplement are subject to change without notice, inasmuch as the picture in the raw material field is changing rapidly and we do not know from day to day what the next shipment of raw material is going to cost us, or how much is going to be alloted to us."

This explanation appears to us to be a clear honest statement of facts. It portrays conditions as they are. Changes are sure to occur, but a downward price trend isn't anticipated soon. However, materials for finishing will continue to be available. They are available in England, Australia and New Zealand, as we see by the representative painters' and finishers' magazines published in those countries. These prosperous looking publications contain a considerable volume of display advertising featuring materials, supplies and equipment for painters, decorators and industrial finishers.

Time to Investigate and Prevent Wasting

With price increases either in effect or likely to be announced soon on practically everything the manufacturer buys, it is imperative to do something about the 101 sources of wastage that prevail in almost every manufacturing establishment. Today materials, equipment, supplies and labor are too precious to be wasted. It is management's job to see that they are all employed and used with maximum effectiveness.

Specific instances of wastage in the finishing department and ways to prevent it, can be found in several articles published in past issues of INDUSTRIAL FINISHING. These ideas, suggestions and recommendations are from finishing foremen and others intimately familiar with what goes on in industrial finishing departments, therefore the information is authentic, practical and timely.

An excellent plan to follow when it is decided upon to do something about wastage in the factory, is to make several first-hand observation trips through the plant. Inspect not only all of the regular work stations, storage areas and material-handling equipment, but look also at the places where certain work is done only occasionally. It is in the latter places that the greatest waste usually occurs. Make repeated inspections in the same places, but on different days and at different times of the day. Ask questions. Go into consultations with the foreman. Put up a suggestion box and post a notice of certain rewards for written suggestions from workmen.

A real concentrated drive to find out where actual wastage is going on, and the development of ideas for correcting it will produce some remarkable results. After putting into operation certain practices aimed toward producing savings and economies, strict rules should be enforced for their continuance. It is the continuance of several small savings and economies that produces substantial total amounts at the end of the year.

Replacing the Air Exhausted From Spray Booths

The replacement of air that is pulled out of a finishing room by exhaust fans is a matter that concerns all users of spray booths. When cold weather is at hand and the building must be closed and heated, this matter is of particular importance, especially to companies that have several spray booths in continuous operation.

Naturally, if 50,000-cu.ft. of heated air is blown outside every minute, then it follows that 50,000-cu.ft. of air per minutes must be drawn in, cleaned and heated to replace what has been expelled. You can easily figure the amount

of air being blown out of the factory by multiplying the square feet area of your spray booth entrance (width times height) by the face velocity of air passing through the booth. The face velocity of air going through the booth, when spraying is under way, is or should be somewhere between 100 and 200-ft. per minute.

Of course, during mild weather, when doors and windows are open (as in non-air-conditioned rooms) plenty of air comes in to replace what is blown out by the exhaust fans.

An engineer of our acquaintance has been giving this matter considerable thought. He is planning an installation wherein air will be supplied to each spray booth by one or more separate ducts. The air will be drawn in through a filtered opening, conveyed to the booth through a duct and released probably at the sides of the booth —possibly at the top and bottom also. The arrangement will be engineered so that a practical balance is maintained in regard to the volume of air taken in, which includes what is blown in through spray gun nozzles, and that which is drawn out by exhaust fans. When the exhaust fans are stopped, probably the supply of incoming air will be shut off or diverted elsewhere.

If this engineer's idea works out as planned, the room air will not be appreciably disturbed. No dust or lint from the room will be drawn into the booth — and, of course, no heated air from the room will be drawn in and blown outside. If the plan will work satisfactorily, without heating the air that is supplied to spray booths, it certainly has interesting possibilities. It will stop a wasteful condition that now prevails and will conserve vast quantities of fuel. Even if it requires heating part of the air, or heating all of it to a temperature considerably lower than the room air, it is something worth looking into. The Editor will appreciate hearing from others who have experience along this line.

SUPER-KAMEX Sensational FINISH
New improved furniture and cabinet finish. Combines best features of Varnish and Lacquer without faults of either. Can be sanded in hour. Clear, gloss, semi-gloss or flat. FREE—Write for sample and proof-panel.
M. L. CAMPBELL CO.
706 East 19th St. Kansas City, Mo.

NALCO DRITHERM CARBON FILAMENT LAMPS
BEST for Infra-Red Ray Drying
Nalco Dritherm Lamps are the carbon filament type . . proved for years in therapeutic and industrial practice as providing maximum emanation of infra-red ray within desirable penetrating band. Made only by—
North American Elec. Lamp Co.
1030 Tyler Street St. Louis, Mo.

Nax-Dar Price Supplement Ready

Under date of Sept. 2, 1941, the Nax-Dar Co., manufacturers of silk-screen process colors, equipment and supplies, 469-483 Milwaukee Ave., Chicago, Ill., issued an 8-page price list wherein new prices on its products are given. Users of silk-screen process colors and supplies should send for one of these price supplements immediately.

Next Furniture Show Dates

Market dates for the Chicago Market, as set by the Board of Governors at their recent meeting at the American Furniture Mart, are: Fall Market, Nov. 3 to 8, 1941; Winter Market, Jan. 5 to 17, 1942.

Letters from I. F. Readers

(Continued from page 8)

formed regarding developments in the paint industry. When he says, "no paint has yet been developed which will not turn yellow with age", I will refer him to the synthetic enamel used on the Virden fixtures. It will not turn yellow. For further information, ask any one of the dozens of manufacturers of synthetic baking enamels. Do not forget, too, that flourescent tubes are "cool", therefore they cannot furnish the heat needed to turn anything yellow. You could hold a lighted one in your hand all day without getting warm.

3) John C. Virden Co. of Cleveland is one of the oldest and most highly respected firms in the lighting-fixture business. In fact, this company was making lighting fixtures for American homes and stores long before porcelain enamel was ever used on lighting fixtures. The company's designs are recognized for their high quality by competitors. The company is not making "cheap fixtures for the low-class trade." Indeed, their products are outstandingly beautiful and the personnel of the company is exceedingly progressive.

4) Porcelain enamel finishes are expensive to apply and require highly specialized materials and equipment. Baked synthetic enamel finishes are reasonable in cost when compared with them. Further, they will not chip when hit with a hammer.

Martindale Respirator

Will you kindly tell us the name and address of the firm who manufactures the Martindale respirator?—S. E. Co.

It is made by the Martindale Electric Co., 1365 Hird St., Cleveland, Ohio. —ED.

Brick Finish on Metal

Would you kindly advise us where we can get some information concerning paint finish on metal, or what companies make a specialty of reproducing brick finishes on metal?—S. & M. Co. (Sheet Metal Products).

We are not sure about this. Can some reader submit an answer?—ED.

Spray Booth Coating

In your June issue of INDUSTRIAL FINISHING, pages 76 and 78, we have read an interesting article regarding overspray breaking into blaze. The author, "C.W.McN" states he has the formula for a compound that can be applied to the walls of a spray booth

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QUALITY *you*
have built in
YOUR PRODUCT

AMERICAN RICHWOOD PRODUCTS CO.
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SPRAY GUN VALUE

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$16.50
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Full Fluid and Spray Width Control . . . Convertible from bleeder to non-bleeder type. Self-aligning Spray Head . . . Cover Assembly adaptable for quart aluminum container or standard pint paint cans . . . Ideal for lacquers, enamels, etc. . . . Write for catalog.

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It's a SNAP To Cut
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ENAMEL STRIPPERS

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Enthone strippers quickly and safely remove baked enamels of the urea-formaldehyde, resyl, glyptal, glycerolphthalic anhydride and bakelite types . . . as well as many other long-oil types of japans and air-dry enamels. Non-caustic, will not etch or attack any metal. Strip rapidly — rinse freely!

The ENTHONE Co.
New Haven, Conn.

and that he is in position to supply quantities of this material. We will appreciate having you put us in contact with this individual, or forward our name to him.—R. Industries.

Information supplied.—ED.

Shellac Versus Lacquer Sealer

There appeared in your July issue a 2-page advertisement in which the following statement was made:

"Manufacturers are realizing that shellac is tops as a sealer and undercoat for lacquer."

This is an unwise statement. It is particularly unwise at the present time when advertising in general is subject to severe scrutiny—when, in fact, Federal Agencies and many so-called "consumer" organizations have attacked advertising from the standpoint of its tendency toward over-statement.

The advertisement goes on to say: "A good undercoat for lacquer must resist lacquer solvents."

Shellac does not resist lacquer solvent. Shellac gum is easily cut by lacquer solvents and if it is applied in a medium or heavy coat, this will result in the shellac gum being cut into the lacquer coat. This brings about a mixture which has caused despair in many finishing rooms. Even if it appears to be successful at first, it has generally resulted in a breakdown of the finish at a later date.

"Must bond firmly with both the wood and the lacquer top coat".

Shellac will not do this. It will bond firmly with the wood but not with the lacquer top coat.

"It must have similar coefficients of expansion and contraction".

That may be true in part, but a combination of shellac and lacquer will not make as much of a unit as lacquer and lacquer sealer, which have the same type of solids and which are made with the same type of solvents.

"Must be an effective sealer for all spots and stains in the wood".

It is granted that shellac will seal the spots and stains in the wood, if any.

Shellac can be made to work as an undercoat under lacquer, if necessary; for example, if it is applied in a very light application, say, two parts of alcohol to one part of 4-lb. or 4½-lb.-cut shellac. Also, it should be given ample time to dry and then should be sanded thoroughly. Then, if the first lacquer application is fairly light (fairly "dry") so that it does not cut too deeply into the shellac coat, you will probably get along fairly well.

An experienced finisher can do these

things. He can produce a good finish under such conditions when it must be done, but why put the manufacturer of wood products under such a handicap? He is entitled to a reasonable margin of safety, especially now when experienced wood finishers are scarce.

The ideal undercoat for lacquer is, of course, lacquer. Generally speaking this point is not disputed. For speed and good sanding qualities, both of which are important points in the sealer coat, we specify a good lacquer sealer.

Lacquer sealer does not resist lacquer solvents. Obviously, neither does shellac. But your lacquer sealer, when used under a lacquer application, unifies with the lacquer coat, whereas shellac will not do so. This gives a uniformly bonded coat—a basic coat that bonds firmly with both the wood and the top coat.

Shellac is a good part of our production. Lacquers and lacquer sealers are a large part of our production in the industrial field, which fact we believe is generally known. We believe, therefore, that we are in an excellent position to judge the above facts impartially.—H. B. YOUNG, Vice President, The Stille-Young Corp.

Yes, Bonderite is Patented

Your publication, INDUSTRIAL FINISHING, is received regularly and we find it a very fine trade magazine. Right now we would like to know whether or not you can answer the following question for us:

Is Bonderizing a patented process and, if so, who holds the patents?

We would appreciate an immediate reply, as we have to do this type of work in the very near future.—Z. Plating Works (Electro Platers & Metal Finishers).

Bonderite is a patented material and, of course, the patents are owned by us. —Parker Rust-Proof Co., Detroit, Mich.

Tinted Lacquers

We would like to obtain the names of one or two manufacturers who make tinted lacquers. These tinted lacquers are referred to in Mr. Al. Matlock's article on page 16 of your July issue. —D. Casket Co.

In the July issue, on page 16, "Finishing Metal Caskets", by Al. Matlock, we found a finish that is interesting. Would you please give us the name and address of the concern that handles the sprayed plating finish, as Mr. Matlock explains in his article?—H. Casket Co.

Al. tells us that he uses a Maas & Waldstein Co. (Newark, N. J.) product for this.—ED.

Finishing Room Problems; Few to Solve Them

I have read your editorial on "Many Finishing Room Problems But Few Men to Solve Them" (June issue, Pages 90, 91) and I think it is a very good article and very timely.

I agree with you 100% when you say that there are today many more finishing material problems than there are manufacturers' representatives and engineers to solve them. While you observed this particularly in the Southwest, I think it is true to a certain extent practically all over the country. I am sure this problem exists in the Southeast.

Several reasons are put forth by manufacturers of finishing materials for not having enough service men to cope with these problems. One reason, I think, is that with the uncertainty of the supply of certain essential raw materials used in the manufacture of some of the more important finishing

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When applied to hands before starting work . . Dries quickly and shields skin like an invisible glove. Protects hands from grease, paint, oils, lacquer, dirt, etc. Easily removed with soap and water. MITTS is safe and economical. Guards hands from irritating materials which cause industrial skin troubles. A generous free sample of MITTS sent on request. Write today.

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Unequalled for filling holes, scratches, mars on wood, metal, marble. FREE Electric knife with 12 doz. order. Write for color card.
M. L. Campbell Co.
706 East 19th St. Kansas City, Mo.

materials, many of the finishing material houses are hesitant about taking on new customers.

Another reason is that the buyer of finishing materials is not as particular, due to the overwhelming demand for furniture today. Many times the furniture manufacturer takes it for granted (and they are right in some instances) that the customers aren't as particular about the finish on the furniture which they buy today as they were in days gone by. But the manufacturer must remember that business will not always be as good as it is today. He should be just as particular about the kind and quality of material and the quality of finish that he gets as he ever was.

Another reason for not having more service men is that many of the finishing material houses are running at full capacity and they (like the manufacturers of furniture and other products) take the attitude of "What's the use of adding the expense of service men when we are selling all the material we can manufacture anyway". I think we need service men today more than ever before.

With manufacturers of furniture stepping up production in many ways, such as installing modern conveyor systems, etc., and due to the scarcity of some raw materials, I am sure many substitutes will have to be found and, in many cases, perhaps entirely new types of finishing materials will come on the market as a result of this.

All of these new materials used as substitutes will cause new and different problems to arise in the finishing room, so I am sure that the finishing material manufacturer who solves these problems will be the one who gets the business. Many times the company that had the business, but failed to solve the new problems, will wonder why they lost the business.

But who will solve these problems? While the manufacturers and their foreman finishers have to cooperate and help solve them, they certainly must depend to a large extent upon well-trained service men and engineers.—H. W. C., Foreman Finisher.

Decals for Graining

Would you please write for the attention of the writer, the name and the address of the company handling the decals for graining furniture, as explained in the July issue of INDUSTRIAL FINISHING, pages 42 through 46?—D. P. Co.

Information supplied.—ED.

Priorities Will Affect You

(Continued from page 13)

use the older slower-baking oleoresinous finishes used before the advent of synthetics. Manufacturers in Class B should also prepare themselves, as their access to synthetic resin finishes is subordinate to Class A.

We can hope that there will be enough for all cases, but the fact that there is an allocation program indicates that some manufacturers will have to substitute. *Possession of a good flexible piece of baking equipment is going to be a great advantage to any user of finishing materials.*

In conclusion, be prepared to make some substitutions in your finishing materials, should it become necessary in your own particular case; and exercise all of your ingenuity and knowledge to conserve the finishes you are now using. Consult back issues of INDUSTRIAL FINISHING Magazine for many articles describing ways to stop leaks in the finishing room.

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This soft harmless cream applied to the hands, arms and other exposed surfaces dries in a minute to a thin, invisible tough film which protects against **paints, lacquers, enamels, dirt, grease and grime.** Removed with ordinary gentle toilet soap and water leaving the skin fresh, clean, smooth and soft. Industrial plants throughout the U.S.A. try it — then repeat in increasing quantities. Send for liberal test sample on firm letter head.

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1 DeVilbiss Q. M., 60-gals. Ditto, except with air motor agitator, $113.00.
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4 DeVilbiss Q. M., 5-gals. Ditto, except with air motor agitator, $70.00.
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4 Binks "T", 30-gals. Ditto, except with air motor agitator, $70.00.
1 Binks "T", 30-gals. Ditto, except with air motor agitator, $120.00.
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